

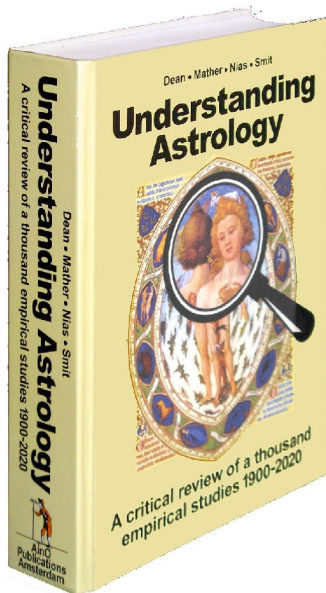
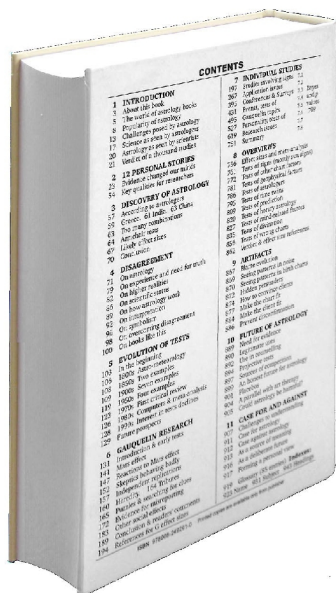
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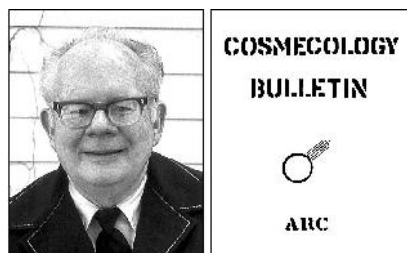
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We welcome your comments

7.5 GAUQUELIN TOPICS Includes topics not specifically covered in Chapter 6.

7.5.1975.1 Mars aspects for 549 French athletes

Charles A Jayne and Ralph S Schaeffer. *Cosmology Bulletin* Number 3, 33-39, 1975. A study of Gauquelin 1955 data supported by an unspecified grant from the Foundation for the Study of Consciousness, Philadelphia PA.



Left: Charles Jayne (1911-1985) in 1976. Among his many innovations in astrology were 16 prenatal charts, all claimed to accurately describe character and events but unfortunately none of them testable.

Right: *Cosmology Bulletin*, journal of his Association for Research in Cosmology (ARC), formed in 1970 as successor to his Astrological Research Associates (ARA) which published *In Search* from 1958 to 1962. Like all his publications they were offset printed in the basement of his house in rural Monroe NY. Each issue featured a different cover design. The symbolic comet on this one accompanied its dedication to Velikovsky "who braved the wrath of the scientific establishment".

From the 570 French athletes with timed birth data from birth certificates listed in Gauquelin's *L'influence des astres* (1955), the authors selected those born during 1862-1900 and 1930-1932 (total N=549) "to make the time distribution of the sample more uniform":

In calculating the positions of the Sun, Moon and Planets, values were rounded to the nearest whole degree on the assumption that any errors introduced thereby would average out in a sample of this size (p.33).

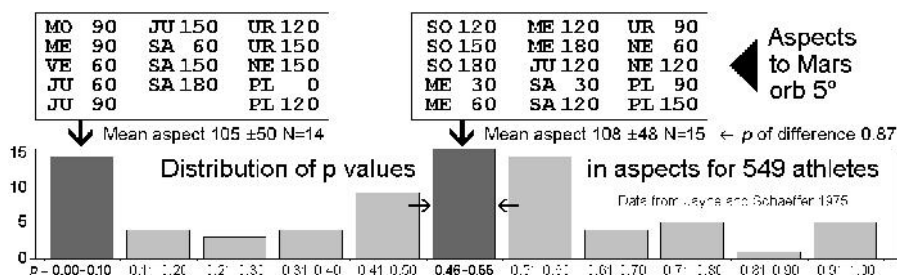
They counted all multiple-of-30° aspects (orb 5°) between Mars and the other nine planets. For aspects to SO, ME, VE the observed frequencies were compared with those given in Ralph Shaeffer's published tables (no reference is given) of expected frequencies. For aspects to JU the expectancies were based on the actual orb periods. For aspects to the rest:

There is every reason to believe that the Mean Expectancy p of aspects is normal for the Moon, Uranus, Neptune and Pluto. For the conjunction, for instance, we have $p = 10^\circ/360^\circ$ or 0.0277. ... the same for the opposition. For the other aspects $p = 2 \times 0.0277$ or 0.0555, as there are two semisextiles, two sextiles, two squares, two trines, and two quincunxes [ie 30,60,90,120,150 aspects]. For Jupiter and Saturn there may be a small departure from these values. ... A recent determination of the actual orb periods for Mars-Jupiter aspects did reveal small differences, which have been embodied in the results. It is surmised, therefore, that the departures of Saturn from theoretical means will be even smaller and will not sensibly affect the results. It has been assumed that there are no demographic effects on the mean expectancies, which may be an unwarranted assumption, but it is surmised that they would be small (p.33).

Overall the aspects to Mars were significantly more numerous than expected ($p < 10^{-7}$). The most numerous were 60, 90, 30 with totals of 358, 343, 326. The planets in order of aspect frequency were JU 222, VE 209, SO 208, PL 206, UR 204, SA 203, MO 201, ME 191, NE 189. The authors noted that dividing the results into N=300 and N=249 gave unstable results (individual results were not given) but concluded that:

The results ... are significant enough to suggest that further research of this type should prove rewarding (p.34).

Comment The authors give observed and expected frequencies for each of the $7 \times 9 = 63$ individual aspect pairs, plus their associated probability via z scores calculated in the usual way by $z = (\text{Obs} - \text{Exp}) / \sqrt{Npq}$. Unfortunately their use of planetary positions rounded to the nearest whole degree means their expectancies should be based on $11^\circ/360^\circ$ not $10^\circ/360^\circ$, so the significance of their results is inflated. But we can still explore them via a plot of p values:



As expected there is an (inflated) peak at the $p=0.05$ end, and a similar but unexpected peak at $p=0.50$. When peaks are compared, there is no significant difference in aspect ($p=0.87$ by t -test) or planet ($p=0.30$ using SO=1 to PL=9).

If we reasonably assume that the order of results based on their inflated *p* values remains much the same when based on their true *p* values, we can conclude that there is no clear difference between the most significant aspects and the aspects closest to chance, which is consistent with Gauquelin's finding of no aspect effects for his professionals, see 6.6.3.

However, there is a vital practical point here that is not obvious. Of the 63 aspects tested by Jayne and Schaeffer, the most significant was Mars square Jupiter, whose tiny *p* value of 0.00007 might lead us to suppose it would be useful in the consulting room. But out of 549 athletes only 9.8% had the aspect. So even if we assume the finding applies to subjects who are not eminent, it will not apply to 90.2% in the consulting room. In fairness the authors are putting forward their results only as a pointer to further research. Otherwise it would be yet another example of the inability of statistical significance to indicate practical significance.

7.5.1980.1 Gauquelin trait words in non-cadent houses

Thomas Shanks, *Cosmecology Bulletin* New Series 2(2), 81-86, 1980.

Gauquelin found that the trait words of eminent professionals with a planet in cadent houses tended to reflect the traditional meanings of the planet, a finding that Suitbert Ertel could not confirm, see 6.6.9. But what were the trait words when a planet was in angular and succedent houses? Using the ACS computer on which the entire Gauquelin database was stored, Shanks found the top observed trait words for Mars were:

MARS	ANGULAR	SUCCEDENT	CADENT
Described as	likes family life cultured secretive dignified	discreet sensitive sincere influenceable	active courageous self-willed dynamic
Not described as	combative energetic self-willed dynamic	ardent courageous energetic self-willed	kind dreamer sensitive dignified

The expected traits appear for Mars in cadent houses, as observed by the Gauquelins, but the traits for Mars in the other houses are different and almost opposite in meaning. This may be because (1) Mars changes its meaning according to its position, which would be John Addey's preferred explanation based on his idea of harmonics, or because (2) the non-cadent houses are merely noise compared with the signals from cadent houses, which was Gauquelin's preferred explanation. Trait word counts cannot distinguish between (1) and (2).

Interestingly, the author gives results for the planets that Gauquelin found to have no effect. Here are their top three observed trait words and (on left) Margaret Hone's keywords:

HONE'S KEYWORDS	ANGULAR	SUCCEDENT	CADENT
Mercury communicative to do with the mind	witty independent scientific	active frank indefatigable	loved animated faithful
Uranus changeable independent	authority devoted charitable	director honest proud	clear comic gay
Neptune nebulous impressionable	imaginative laborious charitable	animates witty honest	comic faithful loving
Pluto elimination regeneration	kind modest proud	great hearted enthusiastic traveller	animates brilliant director

Comment The observed trait words again vary with house but show little agreement with Hone's keywords especially in cadent houses. Which is consistent with Gauquelin's failure to

find effects for these planets (and for houses in general, see 6.3.1), and with Ertel's failure to find character trait effects even for the five Gauquelin planets, see 6.6.9.

7.5.1984.1 Book review: *The Truth about Astrology*

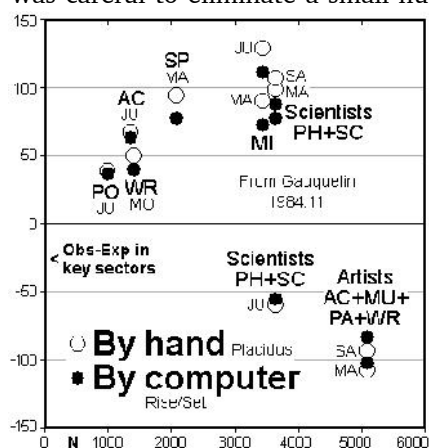
Wout Heukelom, *Wetenschap & Astrologie* 8(2), 2-23, 1984.

A detailed 22-page review of Gauquelin's new book with reproductions of twelve figures. Conclusion: The book is a popular scientific treatise on astrology and is ideal for getting to know the formidable work of the Gauquelins. It is clearly written and contains 29 figures, 6 tables and graphs, and an index. Despite its high price (66 guilders), my advice is to buy a copy or persuade libraries to buy a copy. Every intellectual should read it. On the last page Gauquelin asks "Should one believe in astrology?", which he can answer only by ignoring confirmed believers and opponents. His own ideas have changed over the years. He worries about the possibility of being mistaken, and by the things he has been unable to explain. But after 30 years his passion for investigation remains the same. We eagerly await the results of his future investigations.

7.5.1984.2 Computer re-analysis of our planetary findings

Michel Gauquelin, *Correlation* 4(1), 8-24, 1984.

The results we published in 1972 (12 volumes of profession and heredity data) were based on planetary sector positions calculated by hand since computers were not then available to us. So when Neil Michelsen in San Diego generously made available the use of his ACS computer, I thought it would be worthwhile to check all the hand calculations. In 1979 he and NCGR members had already put on to punched cards the birth data for all the eminent professionals. Which left the heredity data to be entered, which took me six months from November 1979. I was careful to eliminate a small number of errors in both sets of data, since in our published



data a few birth times were not accurate and there were also some typing errors.

The results showed that some bias was inadvertently introduced into our hand calculations by the need to interpolate from Placidus sector tables. But as shown in the adjacent plot, the bias was small and the outcomes are essentially unchanged.

Differences in key-sector frequencies Observed-Expected recorded by hand using Placidus tables (open circles) vs computer-calculated using rise/set positions (closed circles). In each case the latter are slightly closer to 0 than the former, indicating a small bias in the hand calculations. No result is notably worse than the others. (On average the effect size r 's based on positions calculated by hand are about 12% higher than those based on positions calculated by computer.)

With the expert help of Thomas Shanks I was able to answer a question that represented an almost impossible task to carry out by hand. In heredity there is a significant tendency for parents and children to share the *same* planet in plus zones. But could they have *different* planets in plus zones? This required cross analysis of five planets vs five planets for 15,708 parent-child comparisons, which the computer accomplished overnight. The answer was No. Any tendency differed little from chance, and in fact none of the 20 comparisons reached $p = 0.05$. **Comment** The associated effect size ϕ 's ranged from 0.0001 to 0.0145, mean 0.0067.

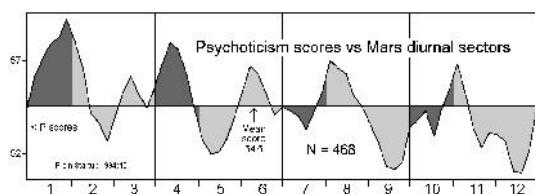
7.5.1984.3 Are there planetary effects for ordinary people?

Michael Startup, *Correlation* 4(2), 4-13, 1984. E = extraversion. N = neuroticism. P = psychoticism.

Sportsmen, whatever their level of performance, tend to be extraverted by comparison with the general population. So the Mars effect (if genuinely related to E) should apply to all sportsmen, not just the elite. However, there is evidence that success in sports is also related

to P. But why is eminence important? There are two ways of testing this: (1) Test populations known to have extreme personalities, but containing no eminent persons, to see if their birth planets tend to favour plus zones. Gauquelin tested 623 murderers and 6412 psychotics but found no clear planetary effects (*Murderers and Psychotics* 1981). (2) Test ordinary people directly with personality measures. However the results of such tests have so far been conflicting, which might be explained by inadequate sample sizes or inadequate tests.

So the author tested 468 ordinary people whose timed births were spontaneous (ie no medical intervention) with 11 measures of personality from the EPQ and 16PF. Three of 23 predictions about planets in plus zones made by five members of the London AIR group (see 8.1.2, four out of the five had to agree) were supported, namely Mars and P+ ($r = 0.083$), Mars and E+ ($r = 0.062$), and Saturn and E- ($r = 0.068$). But only the first was significant at $p=0.05$ one-tailed, and in 23 tests all three were as expected by chance (effect size r 's are calculated from the author's t values). The only other significant one-tailed results in the 23 tests regardless of direction were Moon and P- ($r = -0.021$, $p = 0.04$) and Moon and E+ ($r = -0.015$, $p = 0.05$), but both were opposite to the predicted direction so they could not be counted as hits. There were no predictions about planetary links to N. The author concludes that, given the many existing failures to replicate, no firm conclusions can be drawn from his results.



Psychoticism scores vs Mars diurnal sectors 1-12 reveals peaks in key sectors 1 and 4. But there are two problems: (1) The sample size (468) is very small compared with the sample size needed to reliably detect an effect size of 0.083, ie $10 / 0.083^2 = 1450$. (2) Roughly one-third of the sample were astrologers, so the possibility of a contribution from self-attribution cannot be safely dismissed.

Comment When Gauquelin's results for murderers and psychotics are converted to effect sizes, they confirm the absence of clear planetary effects (compare his professionals in 6.4.7):

	MO	VE	MA	JU	SA	Mean
623 murderers	.039	.011	-.009	.003	-.003	.008
6412 psychotics*	-.001	-.002	-.005	.004	-.012	-.003

* 1266 schizophrenics, 1794 alcoholics, 913 manic depressives, 1137 hallucinatory psychoses, 877 mentally deranged, 333 acute delusion, 92 severe neurosis. All born in France 1867-1942 with two maxima around 1900-1910 and 1920-1930. From M Gauquelin, *Murderers and Psychotics* 1981:7. Includes 7035 birth data.

These results boil down to a classic opposition of theories: Theory (1) is character trait effects see 6.6.9. Extreme personalities like these should show planetary effects. Theory (2) is social effects see 6.13.1. Parents wishing to impress others with their child's astrological connections are free to misreport birth data in the required direction. But even if they did, the children might fail to succeed due to their antisocial nature or for medical reasons, which would scramble the imposed planetary indications. Either way, the winner is theory (2).

7.5.1984.4 A response to Eysenck's views on the Mars Effect

Prof Marcello Truzzi, *APP* 2(2), 27, 1984. The author is a noted moderate skeptic.

Eysenck argued that the case for neo-astrological causalities being present in the Gauquelins' work is greatly strengthened by considering all their work, and the overall extraordinariness of their results. But the Gauquelins' work (although presenting, I think, real anomalies) is still an extraordinary set of claims for which commensurate proof has not yet been obtained. We need independent replications. True or false, the answer lies in continued investigation and more studies. **Comment** Which have now been made, confirming Gauquelin's claims, see 6.9.

7.5.1985.1 Astrological aspects at the birth of eminent people

Michel Gauquelin, *Correlation* 5(1), 25-35, 1985.

The frequency of major aspects (0, 60, 90, 120, 180) of orb 5° between SO, MO, VE, MA, JU and SA was examined for several groups of eminent professionals totaling 15,334 cases. The

study was mostly completed in 1980 by computer in San Diego. When all five aspects were combined the mean excess or deficit of aspects involving planets significant in key sectors was 1.4%. Overall the occurrence of individually significant results was at chance level. According to tradition, scientists should have more SA aspects than JU aspects, military men more MA aspects than VE aspects, and sports champions more MA and JU aspects than VE and SA aspects. But the actual differences tended to be in the wrong direction:

Difference in number of aspects as % of mean expectancy*			Aspects are from
1094 scientists	SA aspects minus JU aspects	-8.5%	SO, MO, VE, MA
3047 military men	MA aspects minus VE aspects	-5.5%	MO, JU, SA
2088 sports (	MA aspects minus VE aspects	-1.4%	MO, JU, SA
champions (	JU aspects minus SA aspects	-0.8%	SO, MO, VE, MA

*Each number of aspects is corrected for differences in expectancy. Mean expectancy is roughly $0.8 \times \text{sample size}$.

There was no consistent preponderance of hard or soft aspects, the mean difference being 2.5% of the mean expectancy. Nor was there any correlation with the results for the same planet in key sectors: The mean difference from expectancy of aspects involving the key planet was 1.4% of the expectancy, less than one-tenth of the mean difference (16.1%) for the same planet in key sectors. The two differences showed no significant correlation ($r = 0.19$, $p = 0.50$, $df = 10$). The absence throughout of significant aspect effects suggests that any apparent aspect effects are in fact due to sampling variations. In other words the results do not support the traditional meanings generally attributed to these aspects by astrological textbooks. Thirty years ago I reported several studies on aspects (mostly at death or in heredity) that I carried out without finding any positive evidence in their favour (*L'influence des astres* 1955:58-62)

Comment In APP 3(2), 4-8, 1985 Françoise Gauquelin takes the *same* data, analyses it by the *same* ACS computer, and finds "significant outcomes" (p.4). But this "significance" is to be expected because (unlike Michel) she includes aspects to the Ascendant and MC, ie aspects that reflect the otherwise unrelated effects of planets just past rise and culmination.

7.5.1985.2 On the lack of a positive heredity replication

Michel Gauquelin, Letter to the editor, *Correlation* 5(1), 36-39, 1985. Why did births from the same area, collected by the same people as in his first study, fail to show the same positive results? Both samples were large and accurate, yet the results could hardly be more different. Checks found no obvious reason why. So what might be happening?

The negative results suggested an urgent check on the first heredity study made during 1959-1960 on the birth records of the 12th arrondissement of Paris. At that time Françoise was working on an analysis of the diurnal distribution of births and had been given permission to consult the birth records. So I seized the opportunity to test the heredity hypothesis.



Technical and financial considerations dictated the choice of it, after which the work of collecting data was a purely automatic procedure explained in detail in *L'Hérédité Planétaire* 1966. The birthdata of all children registered at Paris 12th from 1923 to 1931 were gathered, and the first study of planetary heredity involved 5901 parent-child comparisons. Once the data had been collected, I performed the planetary calculations and statistical analysis by hand. The results were very significantly positive. A recent re-analysis of the data by computer in *Correlation* 4(1), 8-24, 1984 confirmed that the results I obtained by hand were accurate and highly significant.

If there is a bias that explains the results, it can exist only in the way the data were collected. So I paid two students to check the original data against records in the 12th arrondissement.

No bias was found in the original data ... [it] was found to be accurate (p.36).

Here it becomes interesting. Part of the latest study was done in Paris 12th, but this time for children born from 1931 through 1939 following exactly the same procedure as before. The two students who collected the data were the same two who checked the original data. There were 5984 parent-child comparisons, very similar to the original 5901 comparisons. It seemed that nothing was different – except the results. (Gauquelin then gives observed counts, which

are difficult to follow, so here are the same counts converted into phi effect sizes:)

Children born	N	Moon	Venus	Mars	Jupiter	Saturn	Combined	p
1923-1931	5901	0.0327	0.0252	0.0156	0.0154	0.0047	0.0196	0.0008
1931-1939	5984	-0.0008	0.0022	-0.0170	-0.0254	-0.0153	-0.0104	0.07

The effect sizes of the original study are all positive and show an almost perfect diurnal effect similar to that found for eminent people. But only one of the new effect sizes is positive and overall the diurnal effect has disappeared. It does not even reach formal significance.

It could be argued that, just after 1931, the staff of the several maternity wards of Paris 12th suddenly introduced some medical techniques that made births less natural. But the plot of birth times are essentially similar for children born before and after 1931, with a peak in the morning and a trough in the afternoon. This is a good indication of no apparent change in the natural condition of births from the first study to the second one (p.37).

Thus the difference in results cannot be explained by bias or a change in birth conditions.

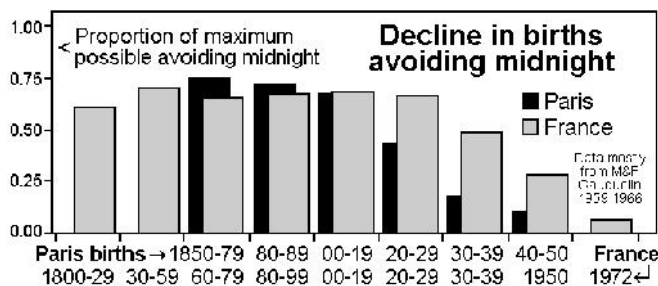
So, what did happen in Paris 12th (and elsewhere)? Nobody knows the answer at this time. I have already suggested that a completely independent replication should be undertaken on fresh material by a team of research workers. I would have not to be involved in the experiment, of course. But I am ready to help financially, with my modest resources, to see the project completed.

Comment The problem seemed completely baffling and no solution was in sight. The cost and effort involved in another large replication seems hard to justify given the tiny effect sizes involved, and to date none has been attempted. But today the problem is no longer baffling and is plausibly explained by the registration of births requiring official documentation rather than accepting verbal declarations by the parents, see 6.12.3 ff.

But the present observations do not mean everything changed around 1931, simply because they apply to only one Paris suburb and may well not be representative of all Paris suburbs let alone all of France. Indeed, Gauquelin stresses this point in *L'hérédité planétaire*:

The documents coming from provincial areas are in general less precise [than in Paris] and contain more birth times rounded to the hour. And often birth times of 0am [midnight] are reported as 11pm or 1am (p.171).

To see what he means we can look at the decline in births avoiding midnight as a proxy for the decline of verbal declarations and the rise of official documentation:



As births are reported more by doctors and less by parents, there is a slow progressive decrease in the avoidance of midnight. In Paris it starts to decrease around 1920 and tends to disappear after 1950. France as a whole follows about 10-15 years later, which suggests that the old reporting procedures tended to persist in provincial areas. Here the proportion (vertical axis) is 1.00 if midnight is totally avoided and 0.00 if midnight is totally not avoided. The Paris results are for 24,948 family births from Gauquelin's first

heredity experiment. The France results are for his 7952 French professionals gathered through 1960, except those for 1950 which are from the French census (total N=834,893) as cited by Françoise in her *L'heure de naissance*, *Population* 14, 683-702, 1959:684. Finally those for 1972 are for a representative sample of 4330 natural French births reported in *Journal of Interdisciplinary Cycle Research* 10, 195-205, 1979.

In a letter following Gauquelin's in the same issue, Nicholas Campion notes how certain sign positions seem to re-occur in his family tree. So for him the connections do exist, which points to the irrelevance of Gauquelin-type statistics:

As each horoscope is unique, and the natal chart may only be understood in relation to human experience, there would seem to be a pressing case for astrological researchers to depart from their apparent total reliance on statistics. ... The tendency to take 30,000 case histories and treat them statistically only destroys the research method (p.39).

This is now a common mantra by astrologers wishing to dismiss awkward results. But it misses the point, which is that once you start counting you need (inferential) statistics to make sense of your results. After all, there are very many chart factors to choose from, so finding family

links will be unremarkable because chance is on your side. Without statistics and proper controls you might never know this.

7.5.1986.1 How strong are planetary effects for ordinary people?

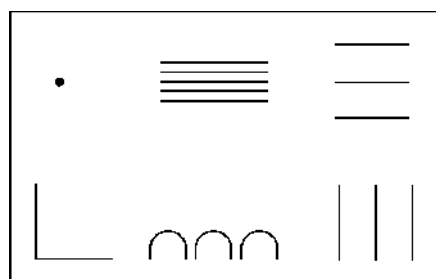
Franz Stark, *APP* 4(3), 12-17, 1986 and 5(2), 15-22, 1987, with comments from Suitbert Ertel in 5(1), 40-42, 1987 and an independent replication by Françoise Gauquelin in 6(1), 19-25, 1988.

A questionnaire listing five character types was completed by 106 persons obtained via an astrology magazine, friends, and addresses chosen at random from the telephone directory. The respondent had to give their birth data and say if they knew their horoscope, and with another person they each had to tick which types the respondent belonged to. Each type was a Gauquelin planet described by eight trait words. For example Type 2 (Venus) was "agreeable, compromising, good taste, charming, tries to please, flexible, diplomatic, evasive", and Type 3 (Mars) "active, impatient, combative, passionate, energetic, direct, self-willed, indefatigable". By 2x2 tests (*planetary type yes/no* versus *planet-in-plus-zones yes/no*) all correlations as phi between type and relevant planet were positive, being generally 0.3-0.4 regardless of knowledge of their horoscope and whether the type was indicated by the respondent or another person, and most were significant. Compared with the typical correlation of 0.04 between planet and profession, these correlations are astonishingly high.

Comment 1 In *APP* 5(1) Suitbert Ertel points out that Gauquelin's much larger samples of ordinary people (eg 16,700) showed no links above chance between character traits and planet, and that self-attribution was not adequately controlled in Stark's test, to which Stark replies that he has started a replication using the same questionnaire but with better controls.

Replication 1 In *APP* 5(2) Franz Stark presents its results. This time the sample size was 100 persons. The results were even less consistent than before (two were negative), and fewer were significant. Nevertheless the Gauquelin effect continues to show up. **Replication 2** In *APP* 6(1) Françoise Gauquelin repeats Stark's study on a sample of 227 persons (mostly from the USA and Brazil) obtained via publication of Stark's questionnaire in *APP* and by handing it out during her lectures. When an allowance was made for the number of tests, no result was significant (the highest correlation was 0.2 for Saturn), nor were they always positive. When respondents were allowed to select individual traits as well as whole types, they often ticked only flattering traits and avoided ticking any type, or they ticked all five types. **Conclusion**

The questionnaire was not sufficiently valid. It needed much improvement and then much confirmation. This will take time, but if we really want a tool for testing Gauquelin effects, it has to be done.



Comment 2 No studies with an improved questionnaire have been reported. In 1985 Michel Gauquelin had 600 people with timed births complete these six geometric figures "in any way they wished". Responses independently judged to be extraverted (larger, less

precise, humorous) showed no significant relation to any Gauquelin planet in plus zones (*Correlation* 5(2), 25-32, 1985).

In 1982 a *Life Themes Inventory* was published by two US psychologists and an astrologer. Its 800 questions (taking three hours to complete) supposedly measured personality on 10 scales corresponding to 10 planets, described as "basic human capacities". For example "I work steadily towards my purpose" and "I have to be pushy to get things going" corresponded respectively to positive and negative Mars principles. Tests using 85 and 60 subjects showed very high correlations (typically 0.75) between the scores for different planetary themes, which conflicts with their traditional independence. Similarly there were keywords related to E in nearly every theme (SO self-expression, ME excitability, VE sociability, MA impulse, JU

joviality, SA restraint, UR change, PL initiation). No factor analyses were made to isolate real themes, but an independent factor analysis indicated that the Inventory measured just one factor (not ten), namely anxiety, strongly contaminated by the effects of social desirability. The Inventory was aimed at psychologists and was full of buzzwords to hide its connection with astrology. Questionnaires (reusable) cost \$2.50, answer sheets \$1.00, computer scoring \$7.50, handbook \$25.00, postage extra. Unsurprisingly the inventory died without trace.

Starting in 1991 a UK group headed by Professor Peter Roberts developed a questionnaire with more than 100 questions designed to measure the "planetary traits" of people, see *Correlation* 18(1), 21-31, 1999. For example questions such as "Do you like to keep on the go?" and "Are you highly competitive?" were designed to find Mars-like subjects. It was tested on 78 ordinary people followed by factor analysis of the responses. Traits related to the same planet were found to cluster, but this was unremarkable because they were designed to cluster in the first place. Overall the results were mixed due to the small number of subjects, "and no published results emerged before the group fragmented" (p.27). For further comments mostly about the inadequate sample sizes see *Correlation* 18(2), 65-67, 1999.

7.5.1987.1 Mars house effects for 375 sports champions

Richard Nolle, *Kosmos* 16(1), 25-27, 1987.

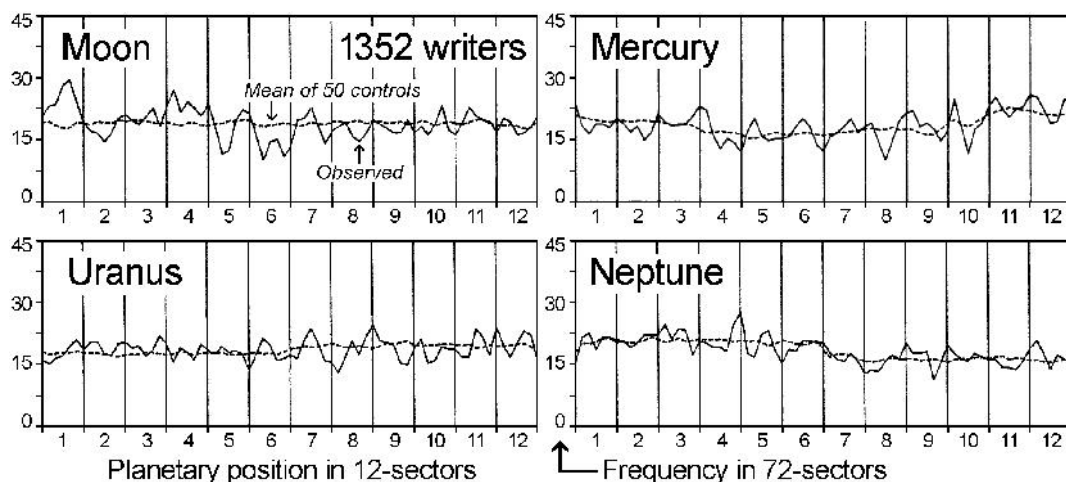
The question of the best house system has plagued astrologers for centuries. My study used 375 sports champions (mostly from the *Gauquelin Book of American Charts* 1982) with 468 non-champions as controls, all with timed births, whose charts were computer-calculated using Placidus, Koch, and Equal house systems. None showed a significant relationship between athletic achievement and Mars house position, although Placidus did best followed closely by Koch. In contrast, Mars conjunct ascendant or Mars conjunct MC with a 5° orb showed a significant relationship ($p = 0.03$) consistent with Gauquelin's Mars effect. These results indicate that house placement is not a significant chart factor.

7.5.1987.2 A new computer analysis of the Gauquelin data

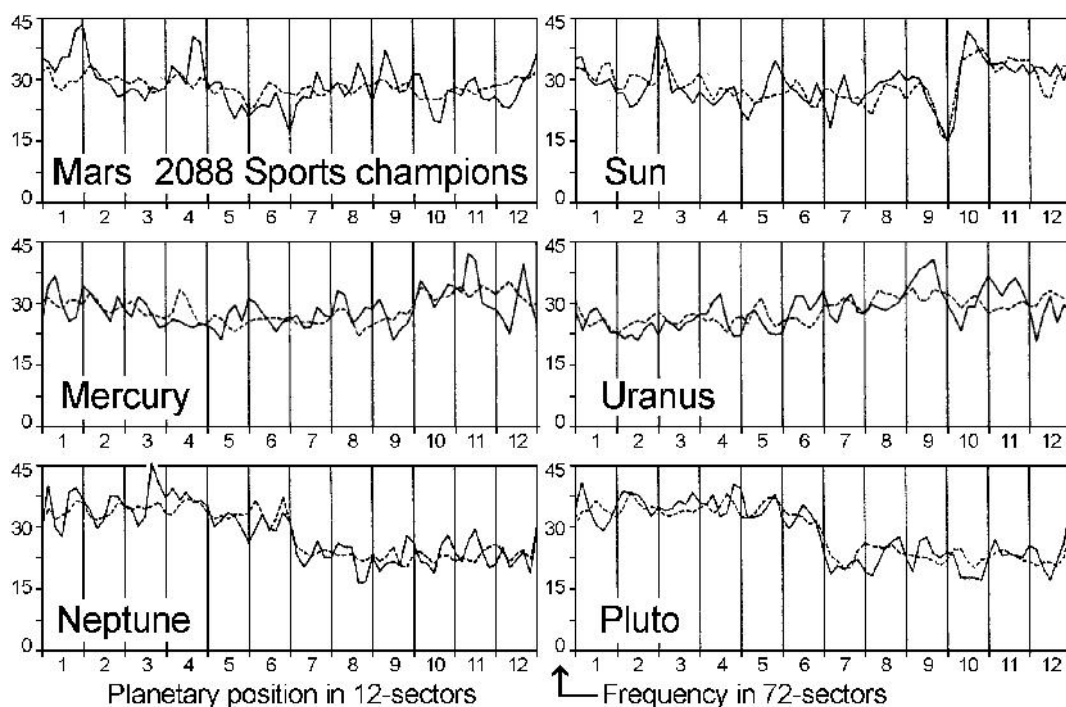
Thomas Shanks. Unpublished study, Astro Computing Services, San Diego. Paper presented to the 6th International Astrological Research Conference, London 20-22 November 1987. These details are from the conference report in *Correlation* 7(2), 2-8, 1987:3 and the author's comprehensive conference handouts.

For each birth in the six larger Gauquelin professional groups (actors, military men, painters, scientists, sports champions, and writers but not musicians, politicians, or physicians) the ACS computer generated 50 random births with year and month profiles matched to the Gauquelin data. The means and standard deviations of the resulting 50 control sets per professional group were then used to evaluate the group results. Analysis included all planets in signs, houses, and sectors, and major aspects of orb 5°. Because the approach looked at all standard chart factors, it avoided artifacts due to selection other than choosing the six groups in the first place. This was a massive study whose graphs and tables alone filled 67 pages of fine print, and took a full month of computer time to calculate, most of it for the 50 controls. But nothing emerged that was new or contrary to previous findings. Increasing the aspect orb to 10° made no difference. Results for Placidus houses were not appreciably different from the results for rise-set sectors, which again confirmed previous findings.

Comment Perhaps more interesting for fans of Gauquelin were the sector results for the five planets Sun, Mercury, Uranus, Neptune, and Pluto. According to Gauquelin these planets never gave significant results in sectors 1 and 4, which is why he never published them in detail. Here the author's results confirm Gauquelin's findings. For example, as shown by the plots below taken from Shanks's handouts, they confirm that the key planet for 1352 eminent writers was not Mercury (the traditional ruler) but the Moon, with no involvement of Uranus or Neptune (the traditional signifiers of creativity and imagination, which are relevant here because the writers were creative writers and novelists as distinct from journalists):



Below, the famous Mars effect for 2088 eminent sports champions see 6.4.11, showed no links with Sun, Mercury, Uranus, Neptune or Pluto, all exactly as Gauquelin had claimed see 6.6.5:



Comment In 1988 Shanks extended the study to 100 control groups and added a study of the prime vertical. But the effort required to cut and paste the printouts into monograph form, and a general lack of interest from astrologers, made it easy to put aside. That was more than 30 years ago. Today there seems little hope that the full results will ever be published.

7.5.1988.1 Personality vs diurnal planetary positions N=1685

David Peter Valentiner. An empirical study of astrology and personality. Unpublished paper, University of Minnesota 1988. One of the few studies to investigate diurnal effects in ordinary people using a reasonably large sample.

Data consisted of complete birth information for 1685 individuals from the Minnesota Twin Registry (the twins themselves were not analysed, just one individual from each pair). Plus their scores on the Multidimensional Personality Questionnaire, a test that involved 200 questions, 11 personality scales and 3 primary factors equivalent to E, N and P. The sample was divided into an exploration sample of N=1185 and a validation sample of N=500.

Birth years were 1936-1937, 1949, and 1954-1955. The circadian rhythm of natural births was clearly present in the 1936 births but progressively disappeared in later years, suggesting that natural births in the early years were mixed with non-natural births in the later years.

Valentiner tested the distribution of the 11+3 variables in the diurnal positions of each planet for significant 3rd and 4th harmonic waves (as found by Gauquelin) and also 5th harmonic waves (as suggested by John Addey in his 1976 book *Harmonics in Astrology*). All significant results from N=1185 were then checked using N=500. Here are the results:

	N=1185	N=500
No of tests (variables x planets)	140	20 (tests giving $p \leq 0.05$ for N=1185)
Results with $p \leq 0.05$ vs chance	20*	3**

*Valentiner does not say how his chance frequencies were calculated. Comparison of his 20 significant results with the expected number of $0.05 \times 140 = 7$ is invalid because his 20 is confounded by correlations between the various scale scores and between different planetary positions. **The most significant result was for Mars and the Achievement scale $p=0.0001$, which when corrected for the number of tests ($N=20$) was still significant at $p=0.002$.

Valentiner found that his significant results mostly involved only the 3rd or 4th harmonic, which suggested that future studies should exclude the 5th harmonic. He concludes:

The overall variance in scale score explained by the planetary positions is very low, in every case less than 2% of the total variance. The significant results are, in part, due to the large sample size and more sensitive methodology. While this does not invalidate the hypothesis that personality test scores are related to planetary positions, it does suggest that the relationship is weak.

Comment Effect sizes for the planetary effects found by Gauquelin, whether for professional people or in the heredity of ordinary people, are so tiny that N=1185 (and especially N=500) are not enough to allow their reliable detection. So the possibility of artifacts due to small sample sizes cannot be ruled out. Nor can artifacts due to the slight decrease in E and N as people age (put to the test in 8.9.2.2), while earlier years (1936-1937) are early enough for social effects to be a possibility. All consistent with the relationship being weak or nonexistent.

7.5.1988.2 Improved test of aspects yields negative results

Suitbert Ertel, *Correlation* 8(1), 5-21, 1988.

For 20,528 eminent Gauquelin professionals the author counted all cases born with 0, 90, or 180 aspects of orb 5° between VE, MA, JU, and SA, but excluding aspects between JU and SA (too long-lasting to offer useful discrimination) and MO (too short-lived to be accurately counted). The frequencies either side of exactness were superimposed. A peak at exactness would support the validity of aspects. But there was no support, see plots in 6.6.3. The author concluded that "within the range of aspects and professions of the study, traditional aspects do not affect nor reflect natal events in human lives" (p.20).

7.5.1988.3 No Mars effect for 44 champions

Albert Bredenhoff, *AinO* 3(1), 36-39, 1988.

The Mars effect is said to favour planetary positions just *after* their rise and culmination. But 44 Dutch or Belgian sports champions from Gauquelin's collection showed Mars frequencies in 12-sectors or in Placidus houses that were higher just *before* rise and just *after* culmination.

Comment The apparently conflicting results are easily explained by the tiny sample size, which leads to sampling errors that are much too high for the reliable measurement of a tiny Mars effect. Nevertheless the results came close to what Gauquelin claimed.

7.5.1988.4 A clash with Françoise Gauquelin

Hugo van Eysselsteyn Kummer, *AinO* 3(2) & 4(1), 78-79, 1988.

In March 1987 Françoise Gauquelin gave a talk on the Gauquelin findings to about 200 people at Groningen University. The author was shocked by what he heard, and sent a long open letter (in English) to Françoise. The letter appeared in *AinO* 2(1), 56-59, 1987. In it he complains

that she dismissed traditional ideas on the basis of scientific findings, yet she never criticised the scientific approach itself. He feels that dismissing signs is wrong, and that relating planets only to the horizon is not enough. Thus his Moon is conjunct the Ascendant, yet he is not a writer (see below) as suggested by the Gauquelin findings. So he objects to her suggestion that astrologers should change their methods to better match the Gauquelin findings. In her reply in *AinO* 3(1), 69, 1988, Françoise points out that the findings are trends only, so there can be many individual exceptions:

So the statistician considers you as one of those who have not followed the trend. But maybe it is because of the Moon on your Ascendant that you like to write long letters (p.69).

To which Hugo van Eysselsteyn Kummer's reply (again very long, in English) concludes that her letter does not make sense:

I am most certainly not a "lunar personality" according to the Gauquelin hypothesis, nor on the basis of my horoscope: everybody properly educated writes. I am not a "writer" or "author" but a scholar, scientist and a professional music and harmonic theorist. ... Well now, if the Gauquelin statistics would produce remarks about my horoscope such as: he is very critical, he is slow to get going, he is a philosopher first thing, he is testing his logic all the time, music and art is slave-labour to him – then you would make a social statement that counts for a number of other people, and I myself would recognise what you say about me. But I don't recognise "lunar personality".

To which the editor added "This discussion is closed now". **Comment** The author evidently does not understand what a trend is. According to Françoise's 1982 book *The Psychology of the Planets*, the lunar personality includes dreamer, naive, sentimental, and 20 other traits, and specifically excludes clear, precise, scientific, and 28 other traits (pp.58-59). Should we make something of these exclusions? Trends can of course be misleading, see 6.9.

7.5.1989.1 Planetary effects defy physical interpretation

Suitbert Ertel, *Correlation* 9(1), 5-23, 1989. See also 7.5.1995.1.

My previous research with Gauquelin data confirmed the existence of planetary effects for eminent professionals. However, my present research casts doubt on Gauquelin's physical explanation. **(1)** For sports champions the planetary effect was unrelated to astronomical variables (distance of Mars from Earth, its angular size, apparent magnitude, declination, right ascension, solar elongation, and radius vector). Furthermore the effect did not diminish during Mars-Sun conjunctions. **(2)** For ordinary people, Gauquelin's claim that geomagnetic activity enhanced the planetary correspondence between children and parents was not supported. Nor did the planetary effect for eminent professionals correlate with geomagnetic activity. It seems that Gauquelin's results with geomagnetism are a chance effect. **(3)** Gauquelin's claim that planetary effects decrease after 1950, a presumed side-effect of applying obstetric drugs, could not be verified with professionals' data because the number of post-1950 births was insufficient for a clear conclusion. **(4)** The accuracy of birth-times on official documents increased markedly through decades 1830-1950 but produced no corresponding increase in planetary birth frequencies, a point Ertel confirms in detail in *Correlation* 9(2), 28-32, 1989. In the light of these results, Gauquelin's midwife hypothesis (planets trigger birth) seems to be untenable, in which case an interpretation of planetary effects in terms of physics and physiology must be replaced by something else. **Comment** And it was, see 6.10.

7.5.1989.2 Planetary effects for 1288 eminent physicians

Arno Müller, *APP-NCGR* 7(2), 17-20, 1989.

Using the official birth records of 1288 eminent physicians (915 with birth times), the author has tried to replicate the Gauquelin effect. As one of the data sources for the present study had already been used by the Gauquelins themselves, comparisons could be made during data gathering and processing to ensure a correct replication study. The initial Gauquelin data were also rechecked and corrected when necessary, but essentially their degree of significance remained the same. The new Müller data showed results in the expected direction for Mars, but not for Jupiter and Saturn. A subsample of 452 particularly renowned physicians increased

the significance of the Mars result. For Saturn, the highest result was observed with French physicians. Overall the present study confirms some of the original Gauquelin observations.

7.5.1991.1 Gauquelin planetary mysteries confirmed

Suitbert Ertel, *AinO* 6(1), 6-11, 1991.

As a nonbeliever in astrology I have many problems with Gauquelin's claim of relations between man and the planets. But after much searching I have been unable to find important flaws in his data. Indeed two new tests of my own have confirmed his findings:

(1) Objective measures of eminence based on citation counts in biographical dictionaries showed that the more numerous the citations (and hence the greater the eminence) the greater the planetary effect, exactly as Gauquelin claimed. (2) Cluster analysis showed that planetary effects are not random but conform to human views (that is, they reflect the same pattern of professional culture as it is represented in our minds), which is not a result likely to have arisen by chance. **Comment** For more on these cluster analyses see 6.12.4.

7.5.1992.1 Synastry aspects in 2174 Gauquelin marriages

Jan F Ruis, *AinO* 7(1), 2-6, 1992 and 8(1), 2-11, 1993 and 9(1), 17-19, 1994.

A sample of 2174 marriages 1850-1928 from Gauquelin heredity data was analysed by computer for aspects of 0, 60, 90, 120, 180°, orb 5°, between Sun, Moon, Mercury, Venus, Mars, Saturn, Ascendant and MC in one chart and the same in the other chart. The expected frequencies were obtained by calculating the mean frequencies from 200 samples of 2174 random couples whose distribution and age differences were similar to those of the actual marriages. By a chi-squared test, frequencies significantly larger than expected were observed for 90° and 120° angles, and for the total:

Aspect	0	60	90	120	180	Total	
Observed	3846	7482	7743	7827	3879	30777	N=2174x8x8
Expected	3801	7580	7566	7632	3809	30388	
Difference O-E	45	-98	177	195	70	389	
p by chi2	0.46	0.25	0.04	0.02	0.25	0.01	
p by 2x2	0.60	0.41	0.14	0.11	0.42	0.08	See Comment

For each marriage there are 8 x 8 comparisons, therefore for 2174 marriages there are 8 x 8 x 2174 = 139,136 comparisons. For the trine (120°) results in the above table, chi-squared = $195^2/7632 + 195^2/(139136-7632) = 4.982 + 0.289 = 5.271$, for which $p = 0.022$, $df = 1$. When the experiment was repeated with orbs that increased in steps of 2° up to a maximum of 11°, the value of difference/orb decreased almost linearly ($r = -0.95$, $p = 0.004$, $df = 4$), suggesting that marriage is more likely when aspects are more exact.

Comment Unfortunately the use here of a chi-squared test is unsafe because it assumes the expectancy is theoretical, ie without sampling error, whereas in fact the expectancies are based on observations that involve sampling error. So it is safer to calculate chi-squared using a 2 x 2 test, which in this case is as follows:

	Sample	Control	
Obs frequency for 120 aspect	a 7827	b 7632	
Obs frequency for no aspect	c 131309	d 131504	
Total cases	139136	139136	$p = 0.11 \quad df = 1$

for which chi-squared = $N((|ad-bc|)^2)/S$, where $N = a+b+c+d$ and $S = ((a+b)(a+c)(b+c)(b+d))$.

Here $p = 0.11$, $df = 1$, or no longer significant. As shown by p for the 2 x 2 results, the same applies to all the previous "significant" results. In other words this large sample provides no evidence that synastry aspects play a significant role in human relationships. Even for the most significant aspect (120°, traditionally claimed to play a dominant role in relationships), the effect size phi (equivalent to r) is 0.0031, which is absurdly small even when compared with the small 0.08 that is typical of Gauquelin planetary effects, see 6.4.7.

7.5.1992.2 Unresolved problems in Gauquelin planetary effects

Françoise Gauquelin, *APP* 8(2), 15-16, 1992.

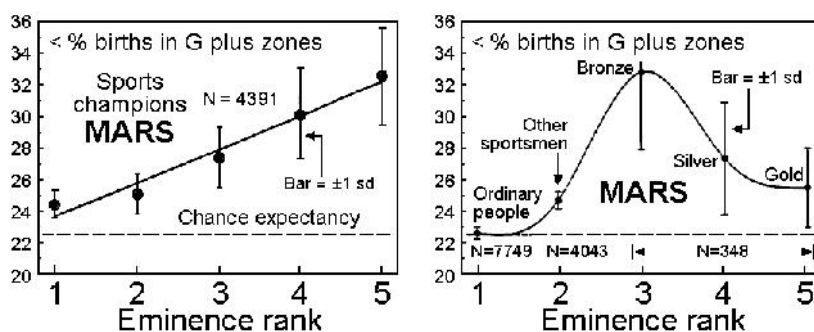
Michel's death left many problems unresolved. They are the *Heredity Hypothesis* (why did a larger sample fail to replicate promising results), the *Character Traits Hypothesis* (why did Michel's and Suitbert's results disagree), and *aspect and zodiac sign investigations* (new tests by astrologers seem positive but erroneous statistics and numerous artifacts explain the results).

Comment As shown in Chapter 6, these problems are no longer unresolved.

7.5.1992.3 Patterns in eminence effects

Suitbert Ertel, *AinO* 7(2), 2-7, 1992. Based on a talk given to the first European meeting of the Society for Scientific Exploration in Munich 1992. See also the further information and comments given in Gauquelin 6.4.8.

According to Gauquelin's eminence hypothesis, planetary effects increase with increasing professional eminence. But my previous results did not always support this idea, which suggested that linear results might have been due to restricted levels of eminence. By extending the analysis to include a wider range of eminence, distinct patterns did emerge:



Left: For the Mars effect and sports champions, the increase with eminence seems to be linear across the five eminence ranks.

Right: But when Ertel extended the range of champions upwards to include Olympic bronze, silver and gold medal champions, the Mars effect at first increases and then decreases.

Comment Reversals involve sample sizes (here N=348 spread over three data points) that are too small to reliably detect the effect sizes said to be involved. But if real they do seem to be inexplicable in Gauquelin terms. But not in terms of social effects. Men of the very highest eminence, namely those who are geniuses, tend not to follow family traditions in the way that men of ordinary eminence do (Eysenck, *Genius: The Natural History of Creativity* 1995:14). Ludwig (*The Price of Greatness* 1995) spent ten years surveying 1004 highly eminent people based on 2200 biographies cited by *New York Times* book reviews 1960-1990. Their incidence in the general population was about 5 per million, which is roughly equivalent to the top 10% of Gauquelin's eminent professionals (which were about 60 per million of the population). Their mean birth year (1882) was similar to that for Gauquelin's eminent professionals (1876). Consistent with Eysenck's observation, the upper 25% (75% were male) were less likely than the rest to enter a profession similar to their fathers (p.178). So they tend to be mavericks, inwardly compelled to do their own thing regardless of what parents might want or stars might indicate. In other words, in terms of social effects, reversals are unremarkable.

7.5.1992.4 Aspects for 44 sports champions

Albert Bredehoff, *AinO* 7(2), 50-51, 1992.

For 44 Dutch or Belgian sports champions from Gauquelin data, born 1940-1950, I counted the number of Mars aspects with an orb of 5°, and compared the results with the expected frequencies given by Scott Vail and Mark Pottenger in their *Tables for Aspect Research* 1986. Aspects from Mars to Sun, Moon, Mercury and Pluto gave the highest counts, aspects to Venus and Neptune gave the lowest counts. I recognise that the sample size is too small for this to be more than a pilot study. **Comment** Yes, much too small. Gauquelin's own studies of aspects in the birth charts of eminent professionals had found nothing significant, see 7.5.1985.1. In particular 2088 sports champions gave no hint that Sun-Mars was high or that Venus-Mars was low, see *Correlation* 5(1), 25-35, 1985.

7.5.1994.1 Synastry of 2824 Gauquelin marriages

Jan F Ruis, *AinO* 9(1), 17-19, 1994.

The previous experiment of 7.5.1992.1 was repeated, this time with a slightly larger Gauquelin sample of 2824 married couples (previously it was 2174), and now including Jupiter. This brought to nine the total number of planets and angles (Ascendant and MC) being compared between one partner and the other. The orb was again 5°. The larger sample size and additional planet substantially increased the total number of aspects, but the difference between observed and expected numbers was much the same as before, as follows:

Aspect	0	60	90	120	180	All	
Observed number	6095	12013	12243	12285	6083	48719	N=2824x9x8
Expected number	6056	12085	12071	12082	6032	48326	
Difference O-E	39	-72	172	203	51	393	
<i>p</i> by chi2	0.26	0.50	0.11	0.06	0.51	0.04	
<i>p</i> by 2x2	0.72	0.63	0.26	0.18	0.64	0.16	

Comment As in 7.5.1992.1, the use of a chi-squared test is unsafe because the test is based on theoretical expectancies, ie no sampling error, whereas the data are based on observations with sampling errors. When the safer 2 x 2 test is used, all results are non-significant and the conclusion remains unchanged. Thus *p* for the 120° aspect is not 0.06 but 0.18, and the corresponding effect size phi is a negligible 0.0021. As a control, the birth data of the married couples had been shifted backwards and forwards in time by 2, 30, 45, 60, 120, 180, and 225 days. This preserved the age difference between couples while shifting the data with respect to aspect cycles that might cause wrong results. Only one difference at -2 days for all aspects was larger than the original, so there is no reason to suppose the results were other than chance.

7.5.1994.2 Gauquelin data tested for 7868 chart factors

Mick O'Neill, *APP* 10(2), 8-22, 1994. And personal communication 2014. At the time the author was the UK's most thorough astrological researcher and computer programmer, and also convenor of the AIR group see 8.1.2.

To see if any chart factor could distinguish authentic charts from controls, the author tested Gauquelin's 15942 professionals (the world's largest set of timed birth data) for every possible combination of chart factors generally considered to be practical (meaning, for example, no degree areas and no hypothetical planets). Altogether 696 planets-in-signs, 576 planets-in-houses, 1960 aspects, 2478 configurations, 340 harmonics, 1716 midpoints, and 102 other factors were tested, a total of 7868, whose components were briefly as follows:

Planets: Sun through Pluto including Moon's mean node, Ascendant, MC, Ascendant ruler, on their own and in combination. **Signs:** tropical signs on their own and in combination eg element, including planetary rulership, detriment, exaltation, and fall. **Aspects:** all multiple of 30° on their own and in combination, weighted linearly by orb from 2.0 when exact to 0.0 at 6° (or 0.0 at 10° if AS or MC involved), plus angular separation for all planets (this measures the overall spread of planets). **Configurations:** all possible combinations of three planets including T-squares and grand trines. **Harmonics:** prime numbers 5 through 29 (1, 2, 3 were already tested as part of Aspects) plus the non-prime 8 and 9. **Mid-points:** all multiple of 45° aspects to midpoints, weighted linearly by orb from 2.0 when exact to 0.0 at orb 1.5° (or 2° if SO, MO, Asc, or MC was involved). **Other:** zodiacal speed, absolute speed, stationary, retrograde, distance from Earth, distance from Sun.

The Gauquelin professionals (individually and in combination) provided a total of 14 data sets, making a total of $14 \times 7868 = 110,152$ individual tests. For each birth chart 4-15 control charts were computer-generated within ± 2.5 years for the same time of day. For each test the average observed score was compared with the average score for the control charts and tested for statistical significance. Among 110,152 results many hundreds will of course appear positive by chance alone. So the tests were applied after dividing the birth data into three replicate groups. The idea is that any real effect in the first group would appear in the second and third groups, whereas any effects arising by chance would be unlikely to appear in the second group, and would be extremely unlikely to appear in the third group. Without replicate groups we could easily be misled by results arising due to chance.

This was a rigorous study on the grandest of scales. It took O'Neill five years of painstaking computerised work that by hand would represent the lifetime experience of thousands of astrologers. If any chart factor could usefully distinguish authentic charts from controls it should have shone through. After all, the subjects were not just anybody, they were eminent professionals all with exceptional achievements, so if these charts did not produce results there would be little hope for ordinary lesser charts. But initially promising results failed to replicate. Indeed, many of them (if they repeated at all) repeated in the opposite direction. Eventually nothing was found that could not be explained by chance.

The tests did reproduce some of the Gauquelin results, but even cadent houses (the closest thing to key sectors) were not especially noteworthy among so many house tests, perhaps due to their direction being inconsistent across professions. In other words O'Neill could not conclude there was nothing there, but if there was something there it was unlikely to be stronger than the Gauquelin results. Which in effect meant that nothing useful could be found.

7.5.1994.3 Births by day of the week N=24,654 + 6372

Frank Jakubowsky. Days of the week. *Considerations* 9(4), 80-84, 1994. Is Tuesday's child (MA) really full of grace?

Using the 14 standard calendars that together form a perpetual calendar, Jakubowsky counted the days of the week on which the 24,654 persons in the international *Who's Who* 1980-1981 were born. Here are the results:

Day	Births	% of total	Diff*
Sunday	3572	14.49	+ 72
Monday	3374	13.69	-198
Tuesday	3575	14.50	+ 3
Wednesday	3524	14.29	- 48
Thursday	3550	14.40	- 22
Friday	3524	14.29	- 48
Saturday	3535	14.34	- 37
Total	24654	100.00	mean 61

*Births
minus
mean
24654/7
=3522.0

The count is lowest on Monday but the overall distribution is not significantly non-uniform (by chi-squared test $p=0.24$, $df=6$). For comparison he then counted the same for a total of 6372 births listed in various sports registers and encyclopedias. Here are the results:

Sport	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total	p by chi2
Baseball	153	150	187	167	190	151	174	1172	0.11
Basketball	73	65	59	67	75	66	65	470	0.86
Boxing	76	81	65	74	88	74	70	528	0.62
Football	238	235	221	212	230	244	234	1614	0.80
Ice hockey	188	224	232	200	204	228	210	1486	0.28
Golf	48	46	50	55	34	57	49	339	0.33
Tennis	53	60	68	39	50	58	51	379	0.16
Track	60	50	46	58	63	51	56	384	0.67
Total	889	911	928	872	934	929	909	6372	0.75
Planet	SO	MO	MA	ME	JU	VE	SA		

The highest
frequency for
each row is
in **bold**

The distributions show no hint of genuine significance. Nevertheless Jakubowsky is able to link the highest counts for each sport to the relevant planet. Thus JU = the need for speed (baseball, basketball, boxing, track), VE = relationships and competitors (football and golf), MA = non-team sports (tennis) or to iron skates (ice hockey). He concludes:

This study may not identify large statistical differences, but it does show that the days of the week, when associated with these different sports, have a character that conforms with the one that astrology relates to their planet (p.84).

Comment Except we could as easily see contrary links, for example JU = more waist less speed, VE = puts harmony before winning. Gauquelin's large samples of 15942 professionals, 12398 parents, 12550 children showed no clear links with days or planetary hours; also the popular rhyme linking planets with days exists in many conflicting versions. See 6.10.2.

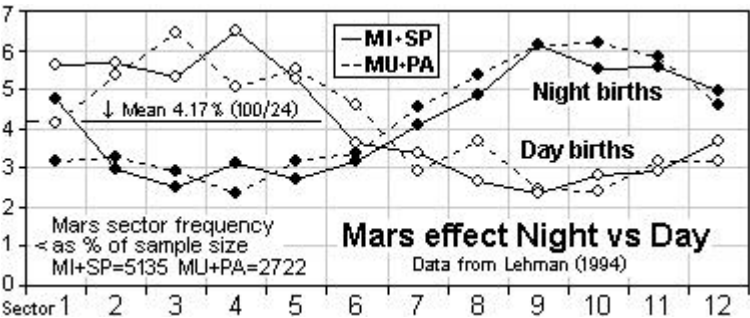
7.5.1994.4 Night-day differences in planetary effects

J Lee Lehman, *Kosmos* 23(2), 22-46, 1994. With 18 graphs.

The author notes that the general decrease in planetary effects for births after 1950, and the simultaneous increase in induced births (which Gauquelin had hypothesised as explaining the decrease in planetary effects), implies that charts for induced births are somehow different:

Astrologers have always assumed that "a chart is a chart". In other words, no one had ever proposed that the chart worked differently for a person born through an induced process. The import of observing that the angular Plus Zone [ie planetary] effect breaks down with samples with extensive induced births *implies* this very thing: that induced birth charts *do* somehow act differently (p.23).

One of the most significant themes to emerge from the clarification of historical techniques via Rob Hand's *Project Hindsight* was that ancient astrologers interpreted night births differently from day births, which is a distinction foreign to modern practice. Furthermore induced births tend to occur during the day. The key question relevant to both points is: Did night-day differences exist in the Gauquelin professionals data? To find out, the author analysed by computer all ten professional groups in various combinations with controls, and presented her results in eighteen clear full-page graphs. The answer was clearly yes. Mars in sectors 1-6 was notably less frequent for night births (Sun in sectors 7-12) than for day births (Sun in sectors 1-6), and vice versa for Mars in sectors 7-12. Typical results are shown below:



The day-night difference was the same whether Mars preferred key sectors (as for MI military men and SP sports champions) or avoided key sectors (as for MU musicians and PA painters). The difference was also consistent across the other professional groups, and also applied to Jupiter to a lesser extent, and to Saturn to an even lesser extent.

For controls the author grouped the data not by the Sun in sectors 1-6 vs 7-12 but by the Sun in odd sectors vs even sectors. This maintained the difference between sectors but minimised the difference between night and day. This time the two groups showed little difference. The author concluded that this may explain the loss of planetary effects when births are induced.

Comment The above results are intriguing because they seem to provide rare support for neglected ancient ideas plus a way of dealing with induced births. But they are consistent with a well-known artifact of astronomy, namely Sun conjunct Mars is about five times more frequent than Sun opposition Mars. In other words for day births, when the Sun is in sectors 1-6, Mars will tend to occupy the same sectors 1-6 and avoid the opposite sectors 7-12, regardless of the direction of any Mars effect. Similarly for night births, when the Sun is in sectors 7-12, Mars will tend to occupy the same sectors 7-12 and avoid the opposite sectors 1-6, which is exactly what the author's graphs and ineffective controls show. The effect can be converted to numbers by counting the frequency of Mars in each sector for each Sun sector, which for all 15942 professionals combined gives the results below for 36 sectors, where sectors 1-18 are equivalent to sectors 1-6 for 12 sectors:

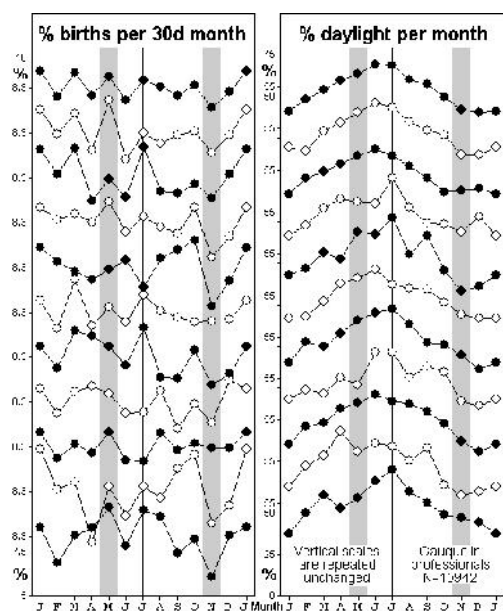
----- Mars 3-sector totals centred on sector -----																		
Sun	29	32	35	2	5	8	11	14	17	20	23	26	29	32	35	2	5	8
2	110	167	190	223	223	174	94	57	45	43	51	77	110	167	190	223	223	174
5	74	137	151	183	194	236	136	86	59	43	36	43	74	137	151	183	194	236
8	52	94	131	156	175	184	155	149	103	78	44	39	52	94	131	156	175	184
11	60	70	95	109	151	189	192	178	118	111	79	49	60	70	95	109	151	189
14	55	43	78	75	107	156	165	189	189	123	89	63	55	43	78	75	107	156
17	80	72	57	64	65	74	115	156	177	138	109	90	80	72	57	64	65	74
20	88	75	59	51	67	88	81	120	144	181	166	125	88	75	59	51	67	88

23	147	124	73	49	43	59	65	84	<u>131</u>	164	187	145	147	124	73	49	43	59
26	<u>204</u>	<u>150</u>	<u>115</u>	92	35	52	43	68	<u>95</u>	<u>127</u>	<u>165</u>	169	204	<u>150</u>	<u>115</u>	92	35	52
29	<u>204</u>	198	<u>152</u>	97	65	47	35	45	67	86	<u>130</u>	<u>161</u>	204	198	<u>152</u>	97	65	47
32	<u>204</u>	223	<u>204</u>	<u>151</u>	101	99	36	25	41	66	<u>89</u>	<u>129</u>	<u>204</u>	223	<u>204</u>	<u>151</u>	101	99
35	<u>151</u>	193	232	178	<u>164</u>	107	63	38	25	44	60	79	<u>151</u>	193	232	178	<u>164</u>	107

Total cases 15942. Mean cell count = $15942 / (12 \times 12) = 110.7$

When the Sun and Mars are in the same sector, the count (shown bold underlined, mean 196.3) is almost always maximum, and counts (shown underlined) $\geq$ the mean count of 111 always cluster nearby. Conversely when the Sun and Mars are in opposite sectors, the count (shown bold italic, mean 42.4) is almost always minimum. Their ratio $196.3 / 42.4 = 4.6$, as predicted by astronomy. To help inspection the first six sector columns have been repeated.

Like Mars, Jupiter is more often conjunct than opposite the Sun, but to a lesser extent (ratio 1.5), and similarly Saturn to an even lesser extent (ratio 1.2), which explains the author's findings for the day-night differences of these planets.



Further complications arise from demographic effects where the months with more births will emphasise their associated hours of daylight and therefore the frequency of Mars in the daylight sectors occupied by the Sun. The adjacent diagram shows how it works:

Left. % births per month for the Gauquelin professionals, corrected for different days per month. The plots show many differences especially for the smaller samples. Mean correlation between all possible pairs is 0.45, range -0.7 (MU vs JO) to 0.80 (PH vs SP). Note the consistently high or low frequencies (grey bands), which match the historically high and low birth months in Northern Europe in the late 19th century. 8.3% = average births per month.

Right. % daylight per month. Sun is in sectors 36, and 1 through 19, that is, including one below-horizon sector (averaging 40 minutes) at each end to allow for twilight. The plots show fewer differences. Mean correlation between all possible pairs is 0.85, range 0.62 (MU vs SC) to 0.96 (PH vs WR). Here the same grey bands have high and low % daylight, which together exaggerate the Mars daylight effect. 55% is the average daylight per month.

The results in the above Comment suggest that the author's findings throw no light on ancient ideas about day and night births, nor on the loss of planetary effects when births are induced.

The author did not calculate expectancies, so the associated effect sizes were not known. However, both Ertel (*Correlation* 9(2), 28-32, 1989) and Dean (*AinO/Astrology under Scrutiny* 13(1&2), 22, 2000) noticed that planetary effects (based on expectancies) in the Gauquelin professionals data tended to be slightly lower for night births than for day births. For plus zones, night effect sizes averaged about 72% of day effect sizes for both positive effect sizes and negative effect sizes. But the effect was inconsistent, and for about 1 case in 5 the effect size was higher by night. There was no clear tendency to favour the more visible planets

How might these results be explained? Ertel suggested that greater alertness by day might lead to better record keeping, except that the effect of increased precision is in the wrong direction, see 7.5.1995.1. Dean suggested that night births might tend to be avoided in accordance with the universal superstition that night was a time of evil, for example it was:

"the domain of witches, ghosts, and the Devil" (Lasne and Gaultier, *A Dictionary of Superstitions* 1984:163, translated from the French). And "the time of spirits and magic", where the pact with mankind is "the day is thine, the night is mine" (Bächtold-Stäubli ed, *Handwörterbuch des Deutschen Aberglaubens* 1927-1941 Vol 6:776, 785).

Alternatively day births might have forced misreporting parents to consult almanacs, which gave them more accurate planetary information than looking at the sky especially if cloudy.

The last was supported by a weak tendency of effect sizes to be higher during winter than during the slightly better seeing conditions in summer (taken as May through October).

7.5.1994.5 Mercury retrograde and 4997 writers

Frank Jakubowsky, *Kosmos* 23(1), 38-42, 1994.

Mercury retrograde is said to indicate weakness or confusion in areas ruled by Mercury. To test this idea I analysed all entries with birth dates 1900-1949 in *Who's Who in US Writers, Editors & Poets 1986-1987*, a total of 4997 births. Mercury was retrograde for 1000 births vs 955 expected, a surplus of about 5%, which indicates that, contrary to its reputation, a natal retrograde Mercury is weakly beneficial for writers. However, the distribution of births was uneven over the 50-year period, so the theoretical expectancies could be inappropriate. The study needs to be replicated. **Comment** Effect size r is a tiny 0.002, and by a chi-squared test the 5% surplus is not significant $p = 0.91$.

7.5.1995.1 Birth time precision and Gauquelin planetary effects

Suibert Ertel, *Correlation* 14(1), 30-37, 1995. See also 7.5.1989.1.

The Gauquelin effect should increase with increased birth time precision. But the data do not support this. On the contrary, the effect tends to diminish with better birth time recordings, at least from 1880 onwards. This might be due to variables depressing the effect, but such variables remain enigmatic. **Comment** Now less enigmatic, see 6.9.

7.5.1995.2 Speculations on Gauquelin trait words

Graham Douglas, *APP* 11(1), 20-31, 1995.

I think we need more study of the structure of the Gauquelin results and their implications for astrology. So I focus on planetary relations via observed trait words. (Then follow 17 pages of speculations such as placing the planets in the four quadrants formed by good-bad traits and hard-soft traits.) **Discussion** by Françoise Gauquelin *APP* 11(1), 32-33, 1995:

In previous issues of this journal, I have expressed my regret that Graham Douglas never goes on to prove the various hypotheses he likes to formulate. Piling up never-verified ideas is like building castles on sand (p.32).

Comment The author followed up with work in these *Correlation* issues during 1997-2008:

16(1) Mars kS counts for 134 terrorists and 42 serial killers differ significantly from those for sports champions. **18(1)** Speculative links between planets and colours. **20(1)** & **23(1)** Planetary effects and birth order. **23(2)** Solar-lunar patterns in Gauquelin data. **24(1)** Patterns unrelated to planetary effects. **25(1)** Seasonal cycles linked to geomagnetic indices. **25(2)** Lunar time and planetary effects. **26(1)** Planetary effects contextualised by Sun and Moon.

But often the chi-squared test was used incorrectly (as in next item), the potential effect of social artifacts was ignored, and no researchers seem to have followed up on the findings.

7.5.1997.1 CTH: an opportunity for subtle bias

Part of Geoffrey Dean, John Addey's Dream, *Correlation* 16(2), 10-39, 1997.

In 1967 Gauquelin had a problem. Heredity was known to involve personality, not occupation. Therefore planetary links had to reflect personality regardless of occupation, otherwise they would have no plausible basis. This idea later became known as the *Character Trait Hypothesis* or CTH. Support for it was crucial. Gauquelin describes his project to test CTH as follows:

I wanted to prove scientifically that the true correlation lay not in the relation between planet and profession, but in the relation between planet and personality: and I also needed to find a scientific way of describing these planetary personality factors. To achieve this twofold goal, I intended using the biographies of outstanding professional people, for whom I had already collected all the birth data and planetary positions (*The Truth about Astrology* 1983:48-49).

He chose the four professional groups where achievement was most strongly linked to a single planet, namely sports champions (Mars), actors (Jupiter), scientists (Saturn), and writers (Moon). During the next ten years, with the help of Françoise Gauquelin and a dozen others, he extracted from biographical dictionaries the character traits for each of four sub-samples:

Planet	Group and mean effect size r for planet in KS and pZ	N	Number of persons in sub-sample	Number of different traits	Total person traits	Mean traits/person
Mars	champions 0.10	2088	627 30%	588	6184	10
Jupiter	actors 0.06	1409	315 22%	2524	17960	57
Saturn	scientists 0.05	1095	225 21%	951	9547	42
Moon	writers 0.12	1352	813 60%	2565	18618	23
Total		5944	1980 33%	6628*	52R	26

* Total 2767 if overlaps are excluded. Above data are from M & F Gauquelin *Psychological Monographs Series C*. Volume 2 *The Mars Temperament & Sports Champions* 1973. Volume 3 *The Saturn Temperament & Men of Science* 1974. Volume 4 *The Jupiter Temperament & Actors* 1974. Volume 5 *The Moon Temperament & Writers* 1977. All from LERRCP (Laboratoire d'Etude des Relations entre Rythmes Cosmiques et Psychophysiologiques) Paris, see 6.13.6.

Gauquelin then obtained independent lists of trait words that were typical of each group. For example, sports specialists in the *L'Athlege* biographical dictionary saw sports champions as *ardent, audacious, bold, calm, concentrated, cool, courageous, energetic, enthusiastic, fighting, gets over difficulties, hard-working*, and so on, for a total of 26 traits. When these traits were counted in the biographies of champions, including repeats in the same biography, the total trait counts for births in key sectors were significantly higher than the expected numbers as calculated by Gauquelin (see later). Similar results were obtained using traits seen as typical by other sports specialists, by sports psychologists, and by university students. Overall the mean effect size r was 0.17 for $N=6$ results. When this approach was applied to the other planets, the results were again positive, with a mean r of 0.16 for the Moon ($N=2$ results), 0.16 for Jupiter ($N=4$), and 0.11 for Saturn ($N=5$), the mean (0.15) being nearly twice the mean (0.08) of the effect sizes of the parent groups in the above table. In each case the surplus depended on whether typical or anti-typical traits were taken, so the effect seemed to be genuinely linked to traits. Gauquelin summarises these findings as follows:

At the birth of "iron-willed" champions, Mars was twice as often present in the key sectors of rise and culmination as at the birth of "weak-willed" champions. "Outgoing" actors came into the world with Jupiter in the key sectors much more often than actors who appear less expansive. "Introspective" scientists were born in greater numbers at the rise or culmination of Saturn, unlike the anti-scientists. And "sensitive" writers were born when the Moon was on the rise or at its culmination (*The Truth about Astrology* 1983:58).

In 1978 he found the same traits were linked with the same planets regardless of profession:

The relationship between planet and character trait could be observed without any need to take account of the professions. Persons with an iron will often had a tendency to be born under Mars, expansives under Jupiter, introspectives under Saturn and poetic temperaments under the Moon (*The Truth about Astrology* 1983:58).

Subsequently CTH was again supported when tested in the same way using new American data (*Report on American Data*. Series D, Volume 10. LERRCP, Paris 1982), and when traits were collapsed into E, N, and P (Gauquelin M & F and Eysenck SBG, *British Journal of Social and Clinical Psychology* 18, 71-75, 1979; and *Personality and Individual Differences* 2, 346-350, 1981). After fifteen years of work it seemed that CTH was well established.

However, there were three problems. (1) Gauquelin's counts were always of traits, not persons. In fact the number of persons is almost never mentioned, as if it were superfluous. For example in *The Truth about Astrology* 1983 there are several references to "50,000 trait-units" but the number of persons is mentioned only once, "about some 2,000 famous people" (p.54). Even in Series C, Volumes 2–5 (the main source for his CTH work), in a total of nearly 1500 pages, the number of persons is mentioned only twice for Mars ("627 champions" pp.33 and 49), once for Jupiter ("more than 300 actors" p.49), and never for the Moon and Saturn. Which, given Gauquelin's usual attention to detail, is a surprising omission.

But a statistic based on the number of *traits* and not *persons* is invalid. No matter how many traits are counted, and no matter how elegant their analysis, the end result is constrained by the sampling error of the number of persons, in the same way that the outcome of a million astrologers judging the same 10 charts is constrained by the sampling error of $N=10$, not of $N=10$ million. Because every statistical calculation in Gauquelin's CTH work uses number of

traits, not persons, the significance of his results is inflated. His p levels are further inflated because the chi-squared and z tests he uses require expectancies to be theoretical (ie without sampling error), whereas his expectancies are based on observations that involve sampling error. In such a situation the correct tests to use are 12×2 and 2×2 contingency tests. To illustrate the extent of error, here are Gauquelin's results for the sports champions who are described by at least one of the 26 *L'Athlege* traits:

	Sample N	Parent N	p by 2x12 test	p by 2x2 test
1	Gauquelin's p values >>		0.000,000,000,16	0.000,000,14
2	1110 traits	6184	0.000,000,03	0.000,002
3	333 persons	615	0.26	0.03

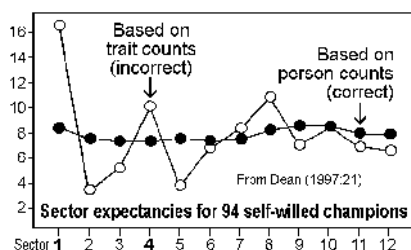
Parent N = total champions from which the sample N is taken

Line 1 shows Gauquelin's inflated p values based on the wrong test and wrong N.

Line 2 shows how p values decrease with the correct test but still with the wrong N.

Line 3 shows how significance and support for CTH largely disappear with the correct test and correct N.

(2) The same problem afflicts the calculation of sector trait expectancies. Gauquelin calculated sector trait expectancies as a proportion of *traits*, but it should be as a proportion of *persons*:



That is, all sector expectancies should be calculated using (persons in sector X)/(total persons), not what Gauquelin used, namely (traits in sector X)/(total traits)

Differences between incorrect (trait-based) expectancies and correct (person-based) expectancies for 94 self-willed sports champions.

The problem is illustrated by Gauquelin's trait and person counts for his sub-set of 615 sports champions (trait counts from *Psychological Monographs Series C. Volume 2 The Mars Temperament & Sports Champions* 1973:100, person counts by extracting sector counts for each of the names listed on pp.168-380, which contains 615 champions not the 627 mentioned on p.33):

Sector	1	2	3	4	5	6	7	8	9	10	11	12	Total
All traits	1086	227	342	663	251	447	546	717	458	559	452	436	6184
Persons	76	39	37	68	43	41	58	55	53	56	48	41	615
Traits/person	14.3	5.8	9.2	9.8	5.8	10.9	9.4	13.0	8.6	10.0	9.4	10.6	10.1

The value of traits/person is rarely close to the mean of 10.1. Instead it varies widely, from lows of 5.8 in sectors 2 and 5, to highs of 11.0 in sector 8 and 14.3 in sector 1. The calculation of expectancies based on traits would require uniformity, but it does not exist.

(3) Gauquelin had to translate all traits from French into English. But usually there is no one-to-one correspondence, as inspection of standard French-English dictionaries reveals. As a result the correspondences are often ambiguous. For example, *actif* (the 12th most numerous trait for sports champions) = *active, agile, busy, energetic, engaged in work*, all of them clearly Mars. But *sensible* (the 8th most numerous trait) = *acute of feeling, evident, impressionable, lively, obvious, perceptible, responsive, sensible, sensitive, susceptible, sympathetic, tender*, giving a confusing choice of Moon, Mars, Jupiter or Saturn. Ultimately there is no confusion because Gauquelin always gives the translation used for each trait.

Nevertheless the meaning used by a French author in a biography can still differ from the meaning used by Gauquelin. For example Gauquelin always translates *volontaire* as *self-willed*, but standard French-English dictionaries say it means *voluntary, willing, spontaneous, head-strong, wilful*, ie not consistently *self-willed*. Conversely, English-French dictionaries usually translate *self-willed* as *obstiné* and *opiniâtre*, giving *volontaire* only sometimes. Consider these examples from Volume 2 where *volontaire* is translated as *self-willed*:

Henri Bernard is "Grand et fort, mais souple et volontaire" (p.190).

Jean-Rene Lacoste is "Methodique, travailleur, volontaire, serieux" (p.286).

Georges Pelletier d'Oisy is "simple, modest, energique, volontaire" (p.330).

Bernard is *souple*, which can be physical (supple, lithe) or psychological (flexible, compliant). Which applies here? The first suggests grace and trimness of figure, which conflicts somewhat with being *grand et fort* (big and strong). So perhaps the second applies, which is compatible with *volontaire* = *willing* but not with *volontaire* = *self-willed*. Lacoste is methodical, hard-working, serious; while Pelletier d'Oisy is simple, modest, energetic; but again the context does not allow us to assume that *volontaire* means *self-willed* rather than *willing*. Furthermore, of the sub-set of 615 sports champions, there are 94 described as *self-willed*, usually among an average of 20 other traits. But for such a central trait (the single most typical or atypical trait that Gauquelin uses to characterise sports champions is *iron-willed* or *weak-willed*, from *The Truth about Astrology* 1983:35) a frequency of only 94 out of 615 seems rather surprising. As do the 282 out of 615 champions who are not described by any of the 26 *L'Athlète* traits.

In fact such counts suggest that Gauquelin may have sometimes overlooked biographies mentioning relevant traits if the champion did not have Mars in key sectors, thus inflating the counts for key sectors, a view supported by the high proportion with Mars in key sectors among the 94 self-willed champions (data sources same as in previous table):

Sector	1	2	3	4	5	6	7	8	9	10	11	12	Total
Observed	21	2	4	11	3	6	10	8	4	14	7	4	94
Expected	8.4	7.5	7.3	7.3	7.5	7.3	7.5	8.2	8.6	8.6	8.0	7.9	94.1

The peaks at sectors 1, 4, 7, 10 contain an astonishing 60% of the champions, almost twice the expected number. But three of the biographies for the 35 champions in the two most frequent sectors (1, 10) do not contain *volontaire* (*self-willed*) or *volonté* (*will*), namely André Leducq, Ignace Heinrich, and Urbain Wallet. So here are three examples of inadvertent Gauquelin bias creating traits to fit his important hypothesis – that sector position was related to traits. In a September 1992 letter (in German) to Suitbert Ertel, Françoise Gauquelin had this to say:

I am well aware that Michel knew too well the planetary positions of the 'stars' (renowned personalities) of our data base so that he was certainly influenced while analysing, on his own, their biographies. I often had disputes with him about that, but alas by then I no longer had any influence.

Of course it may be that Gauquelin was convinced that any bias, if present, could never create a planetary link with personality. But in fact *not much bias is needed to produce the observed outcome*. For example only 1 in 12 traits needs to be biased to make an effect size typical of trait effects. So Gauquelin could be 11/12ths or 92% unbiased (at first sight a level not worth bothering about) yet enough bias would remain to explain his results.

When points (1)–(3) are taken together, the failure of others to confirm CTH is unremarkable. But because the failure involves traits it is of no consequence for occupation and heredity effects.

Comment The failure is consistent with the portrayal of astrology in 19th century almanacs, which tends to relate planets to occupation rather than character, see 6.9.2, perhaps because it is easier to show occupation in woodcuts than it is to show character. In other words the failure to confirm CTH is what the presence of social artifacts might predict, see 6.6.9.

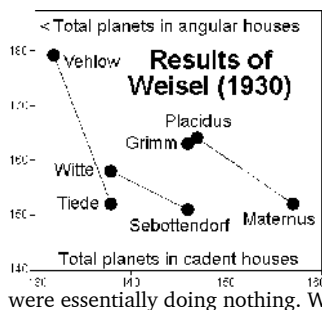
7.5.2000–2003 Dean – Ertel interchanges on social artifacts

Geoffrey Dean, *AinO* 13(1&2), 85-87, 2000 and *AinO* 14(1&2), 4-page insert, 2003. Suitbert Ertel, *Correlation* 19(2), 37-46, 2001; and 20(1), 30-41, 2001; and 20(2), 39-48, 2002; and 21(1), 35-39, 2002; and 21(2), 11-21, 2003. Wout Heukelom, *AinO* 14(1&2), 1-3, 2003. Criticisms of social effects are summarised in 6.13.3 ff.

7.5.2009.1 Is there a planetary effect for painters?

Rüdiger Plantiko, *Zeitschrift für Anomalistik* 9, 82-107, 2009. Dr Plantiko is a mathematician working in Zurich. In 2007 German astrologer Roland Meier had published in German an article on the DAV website "Is astrology provable? The house problem in astrology". Meier had analysed 1740 painters for planetary positions in Placidus, Koch, and Vehlows house systems, and found that Vehlows houses gave the best match with astrological expectations.

Comment Nearly 70 years earlier Erich Weisel had reached the same conclusion after analysing 50 famous people by seven house systems (*Das astrologische Häuser-Problem* 1930:65-71), which was one of the earlier attempts to test house systems empirically. Weisel assumed that people who are prominent in areas of public life must have Angular



houses well occupied, so he counted planets in Angular, Succedent, and Cadent houses by each system. The seven systems were Placidus, Vehlow (equal house with cusps mid-house), Witte (equal division of equator), Grimm (Porphyry, equal division of Ascendant-MC quadrants), Tiede (Porphyry with cusps mid-house), Sebottendorf (Placidus with cusps mid-house), and Maternus (equal house). To avoid latitude effects he was careful to choose births from the central zone of northern latitudes. Vehlow gave the most Angular and the least Cadent planets. Weisel doesn't compare Angular houses with other houses to see if his assumption is true for his group of prominent people, nor does he include other systems such as Campanus and Regiomontanus. Yet he deserves a mention for attempting an empirical solution to *Das Häuser-Problem* at a time when others were essentially doing nothing. With thanks to Jan Kampherbeek for extracting house descriptions from this source.

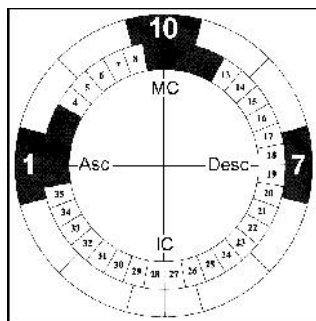
Plantiko notes that choosing a house system is a concern for every astrologer, who usually makes a choice or rejection based on one or more of the following criteria:

- Conformity based on whatever the teacher or textbook says.
- Authority based on longevity or classical authority.
- Theory based on the most elegant construction.
- Tests usually based on a dozen or so cases.
- Denial. Reject houses keeping only the Ascendant and MC axes.

But except in Meier's case, the results of tests are rarely statistically significant. He says:

Compared to the usual way of finding the "best" system of house cusps, Meier's statistical approach is clearly more rational – the idea is so obvious that it makes me wonder why there are almost no formal studies in this direction. I know of only one early study [Weisel's] trying to tackle the astrological problem of houses in a statistical way (p.83).

Initially Meier had taken the painters listed in Heinrich Taeger's 1992 *Internationales Horoskop Lexikon*. He discarded dubious or missing birth times, and painters with a second profession such as graphic designer or sculptor. The result was 192 cases which he analysed by house position, and by the planets considered most relevant to the arts, namely Moon, Venus, Neptune and Pluto. He found that, together with Mars, they formed the Top Five planets in houses 1, 7 and 10. But only for Vehlow houses, not Placidus or Koch.



Preferred planetary regions for painters according to Meier (Vehlow houses 1, 7, 10, outer circle) and Gauquelin (plus zones 36-3, 9-12, inner circle). Vehlow houses are equal houses with cusps mid-house.

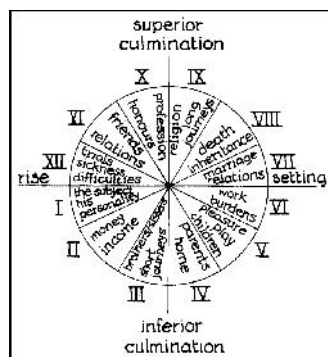
This result replicated when tested on a further 1740 painters taken from the DAV database (DAV is the Association of German Astrologers). The Top Five planets again preferred Vehlow houses 1, 7 and 10, but not Placidus or Koch. So his earlier result seemed unlikely to be due to chance. But Meier made no statistical tests. To fill the gap, Plantiko generated 1000 controls for Meier's two sets of painters (N = 192 and N = 1740) by randomly shuffling birth times, and re-ran Meier's tests. In each case only Vehlow houses were consistently significant:

Sample	Placidus	Koch	Vehlow
N = 192	p = 0.83	0.44	0.012
N = 1740	p = 0.22	0.051	0.02

Plantiko noticed that 66% of 192 and 80% of 1740 came from Gauquelin's collection of painters, and that when these cases were removed there was no longer any house effect. He called this the "Gauquelin Archive Effect" but was unable to explain how it could work.

Comment The "Gauquelin Archive Effect" is not hard to explain – it is due to eminence. Removing every eminent painter from the tested data set would leave painters for which no planetary effect is to be expected. But back to the house problem. Without forgetting the rejection of houses as old-fashioned and not needed by the Ebertin school (see 7.2.1972.2), the most definitive tests of houses were of course those of Gauquelin, not just in his famous work on planetary effects work but also in his earlier less famous and more general work, see

6.3. In his book *The Truth About Astrology* 1983:118 Gauquelin gives this diagram of traditional house meanings, and then points out:



None of this agrees with the interpretation of my results. The contradiction between the unhealthy influence of House XII, that of the rising planet, and the considerable number of well-known people born with the planet in this zone of the sky is only too obvious. And what relevance have large animals, religion and philosophy for all those who succeed with a planet in House IX, immediately after the superior culmination? ... There would seem to be only one conclusion. ... the division of the diurnal movement inevitably leads to major errors. ... it might be that the ancients knew precisely where to place the zones of high and weak planetary intensity and, indeed, some contemporary astrologers are convinced that this is so. Nevertheless, astrology continues to apply laws which are apparently formulated in the opposite direction to mine, despite the fact that my work has been widely available for the past 25 years (pp.119-120).

That 25 years is now 60 years, but the empirical evidence is still ignored by most astrologers.

7.5.2011.1 Did Saturn really help 2823 marriages?

Julián García Vara. Saturn and marriage: a statistical study [in Spanish]. The author specialises in harmonics with results given in numerous blogs like the one summarised here, which is from astrologia-viva.blogspot.com. The k th harmonic chart is one where all natal positions have been multiplied by k and reduced to less than 360° , so counting the number of conjunctions in say the 13th harmonic chart is the same as counting all aspects in the natal chart that are multiples of $360^\circ/13 = 27^\circ41.69'$. The orb for harmonic aspects is usually $(1/k) \times \text{orb}$ for a natal conjunction.

The sample of 2823 marriages was all of the two-parent cases from Gauquelin's 1966 heredity experiment (most had reported only one parent). Vara counted the number of conjunctions between each couple in the first 13 harmonic charts, orb = $13^\circ20'/k$ where k = harmonic number, here 1–13. The orb is large but was necessary to preserve reasonable accuracy in harmonic calculations despite its decrease, for example to $1^\circ1.54'$ in the 13th harmonic.

Counts were between the normal geocentric positions of SO through SA in one chart (divided into his vs hers) and SO through SA in the other chart, divided into his planet before-vs-after her planet in the zodiac (roughly him older than her vs younger than her).

Vara made the same counts for heliocentric positions. The number of planetary pairs where the difference in conjunction counts exceeded $\pm 15\%$ of the expected counts were:

Geocentric pairs	19 differences (9 positive 10 negative)	) The Moon was of
Heliocentric pairs	26 differences (19 positive 7 negative)	) course excluded

(He gives the results only as % of the expected frequencies without giving the expected frequencies or sample sizes.) This result led Vara to conclude that (at least in this sample):

Heliocentric charts are more determinant in the process of choosing partners than geocentric charts.

Back at geocentric charts and aspects between Saturn in one chart and a planet in the other chart, the mean value across the first 13 harmonic charts of

(observed – expected count) / (expected count) expressed as a percentage

for his or her Saturn vs his or her other planets, divided according to (1) whether Saturn or planet came earlier in the zodiac, and (2) which one was his or hers, was:

Comparison		Mean (obs-exp)/exp count %			
SA vs	Earlier in zodiac	Saturn Planet	Planet Saturn	< His	< Hers
SA	His	10.5			
	Hers	-0.1			
JU	SA	-7.3	-5.6		
	JU	-0.6	10.5	0.8	8.0
MA	SA	1.3	-4.5		
	MA	1.7	5.7	1.1	4.2

SD = Standard Deviation

SO	SA	5.4	0.8		
	SO	-1.6	-7.7	-0.8	5.5
VE	SA	-0.6	-0.3		
	VE	0.8	-3.5	-0.4	2.6
ME	SA	-5.4	8.5		
	ME	-4.8	-2.4	-1.0	6.5
MO	SA	-3.7	5.1		
	MO	4.0	0.4	1.5	4.0

Mean SD = 5.1

Thus in the bottom row the mean frequency of aspects between his SA and her MO was 4.0% more than expected, while the same for his MO and her SA was 0.4% more than expected, both with MO earlier than SA in the zodiac.

The above table may seem overly complicated but is less daunting than Vara's original tables showing the value for each individual harmonic aspect, from which he selects particular values for interpretation. Thus he takes 10.5% in the top row for SA vs SA contacts as the highest value (provided his Saturn is earlier in the zodiac than her Saturn) and concludes:

If Saturn of the man makes conjunction with Saturn of the woman *in any of the first 13 harmonics*, the probability of consolidating a possible marriage bond increases to a variable extent (around 10.5 percent on average),

Therefore, contrary to tradition (at least in this sample), Saturn was:

the main promoter of marriage alliances ... this result may surprise. But [for a] lasting family structure, economically resistant and socially acceptable, this kind of thing is difficult to achieve without the active help of Saturn.

Comment But apart from his JU vs her SA being equally high at 10.5% (provided her JU is earlier in the zodiac than his SA), the entries in the above table seem to be all over the place, as are the planets, harmonics, and direction for individual harmonic charts as shown by the most extreme three differences across the four categories *2 earlier-later* x *2 his-hers*:

Conjunction is to	Entry = Planet-HN-Difference from expectancy (<u>is negative</u>)					
	His SA is earlier then her SA			Her SA is earlier than his SA		
	His SA	SO-6-37%	SO-3-33%	SA-9-32%	MO-10-25%	SA-12-23%
Her SA	SA-9-32%	MA-8-28%	JU-9-25%	ME-8-28%	SA-12-23%	MA-9-21%

The mean SD of 5.1 in the first table above is what we would expect if the four percentages varied at random between -9% and +9% (the actual value for 50,000 replications was 5.2%), which implies that the distribution of results may be much the same. Indeed, Vara's division of his results into *earlier-later* and *his-hers* may be precisely the problem. Look at it this way:

For each couple Vara divides the counts into 13 harmonics x (7 x 7) planets x 2 earlier-later x 2 his-hers = 2548 possible combinations, which compares with 7 x 7 planets x 8 major aspects = 392 possible combinations in a traditional chart comparison. In effect dividing the counts reduced sample sizes, increased sampling artifacts, and thus created bigger (and meaningless) percentage differences to catch the eye. So before we can proceed there is an urgent need for controls, replication, statistical tests, sample sizes, and actual counts rather than percent ages, plus details of how the expectancies were calculated, none of which Vara provides.

On the other hand from an astrological point of view none of this matters, because however unlikely the outcome (the Greater *Malefic* promotes *marriage*?), astrological symbolism can support it without effort, as Vara demonstrates. In other words symbolism 1, science 0.

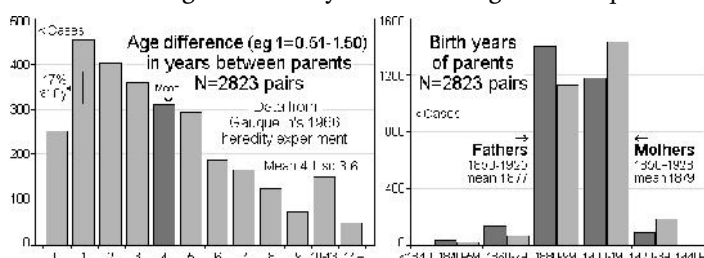
Nevertheless notice how JU-SA contacts are just as numerous as SA-SA contacts, albeit only for selected sub-samples. Here JU and SA are the slowest planets, which suggests an artifact may be present that we can now explore by considering speed:

Saturn's period is 29.5 years, so its mean speed is $360^{\circ}/29.5 = 12.2^{\circ}$ a year. As a rough first approximation, in the *k*th harmonic the probability of a conjunction of orb $13^{\circ}20'/n$ between Saturns in two charts will be close to 100% if the two births are separated by the *k*th sub-multiple of the Saturn period. That is, by these number of years apart:

$0 \pm (1.1)$ or $29.5 \pm (1.1)$ years for the **1st harmonic** (ie natal) chart
 $(0/k) \pm (1.1)/k$ or $(29.5/k) \pm (1.1)/k$ years for the **kth harmonic** chart where $1.1 = 13^\circ 20' / 12.2^\circ$

The above is simplistic because Saturn is retrograde each year for 36% of the time but it is enough to get us started.

Outside of these periods the Saturns will be too far apart, so the probability of a conjunction will then be close to 0%. If the births are uniformly distributed we can in principle estimate the proportion of births with Saturns conjunct in any of the first 13 harmonics for a given difference in age. But analysis of the original Gauquelin data shows that neither the parents'



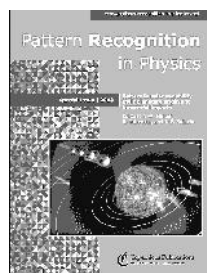
births nor their differences in age are uniformly distributed:

Age differences range from 0 years to 30+ years, Mean is 4.1 and 80% are 6 years or less. Mothers are the older in 20% of cases. Births occurred during 1850-1928, mean 1878 with 90% in a 38-year window and 82% in a 30-year window, both centred on 1900.

The above age differences are calculated using the year, month and day of birth. Here the most relevant result is the 17% of parents born ≤ 1.0 years apart, during which time Saturn will have moved an average of 12.2° compared with the natal conjunction orb of 13.3° , which suggests that the pre-eminence of Saturn in Vara's harmonics is due to demography rather than astrology. There is also a problem with the harmonics concept itself, see 7.7.1977.1.

7.5.2015.1 Does the Mars effect begin at conception?

Graham Douglas. The Gauquelin effect is born at conception. <http://cura.free.fr/13+/1602doug9.pdf>, 63 pages. He states that no testable theory has been put forward to account for Gauquelin planetary effects, and suggests that the biggest obstacle to progress may be the assumption that planetary effects come into existence only on the day of birth. With many thanks to Douglas for helpful clarifications and for the data plotted in the first graph below.



Recent work in physics has stressed the plausibility of planetary effects on solar activity (*Pattern Recognition in Physics* 2013 entire issue), which raises the possibility that the resulting variations in solar-induced geomagnetic activity could have an effect on human births. There is no evidence of an association between Gauquelin planetary effects and geomagnetic activity at birth (Ertel, *Correlation* 9(1), 5-23, 1989, see also 6.6.8), but Douglas suggests a connection could exist with geomagnetic activity at conception that has hitherto been overlooked by researchers.

He points out that a direct planetary effect on geomagnetic activity is much less plausible than an effect via the sun. So Gauquelin planetary effects could be the result of their effect on the sun but beginning at conception rather than birth. Here are the details for Mars:

(1) Heliocentric conjunctions and oppositions between Earth and Mars cause a solar eruption (Wang et al *Geophysical Research Letters* 27, 505-508, 2000). (2) Solar eruptions cause geomagnetic micro-pulsations in five bands Pc1 through Pc5 (*P* for pulsations, *c* for continuous) with periods of a few seconds to a few hundred seconds (Korschunow, *Journal of Geophysics* 51, 141-146, 1982). The last overlaps the period of uterine muscle contractions during labour and shows four peaks a day similar to the Mars effect. (3) Solar activity correlates with the hour of birth and with Earth-Mars phases at conception, see later. (4) The Mars effect begins to decline around 1915-1920 in parallel with changes in the Earth-Mars distribution at conception, which is consistent with the increasing use of family planning after World War 1.

The above details point to a Mars effect that begins at conception rather than birth. If true it throws new light on every area of Gauquelin research. In fact more recently Douglas says:

Strong evidence that the date of conception is important to the whole story of planetary evidence is presented in my study of the Mars effect [the study summarised here] (*Correlation* 31(2), 16-20, 2018:18).

Comment Micro-pulsations are an active field of space research. But Douglas does not use the results to explore the overlap with uterine contractions, which is important because the overlap by itself is no more suggestive of a connection than it would with say traffic lights or train departures. Pc5 pulsations have periods of 150–600 sec, which compare with human uterine contractions (driven by the pituitary hormone oxytocin) that typically last 45–60 sec every 220–360 sec (for comparison the human heart rate has periods of 0.2–5 sec). The nature of the connection is not helped by the non-uniform distribution on Earth of Pc5 pulsations:

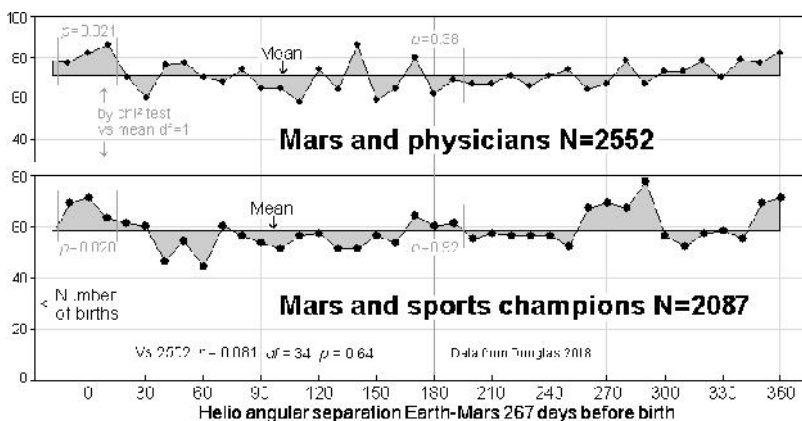
According to Shi et al (*Journal of Geophysical Research: Space Physics* 123(5), 4215-4231, 2018) the intensity of Pc5 pulsations depends on latitude, time and season. Pc5 pulsations with an average period of 150 sec are dominant at high latitudes at dusk and in winter. They tend to occur during periods of low geomagnetic activity, are lowest in summer, and are seldom observed at latitudes below 60° except during intense magnetic storms, which typically average only five a year at US latitudes (more at solar maxima, less at solar minima, frequency varies as $1/\text{intensity}^n$ where n is typically >2 (Love and Gannon *Annales Geophysicae* 27, 3101-3131, 2009:3117), each lasting a few days or roughly 5% of the time. But latitudes below 60° include the USA, most of Western Europe, and all inhabited regions of the southern hemisphere, so a general application of Pc5 pulsations to Gauquelin births seems unlikely.

Nor does Douglas explore mechanisms that could connect them with the birth process:

According to Kleimenova et al (*Physics of Auroral Phenomena, Proceedings of the 31st Annual Seminar, Apatity*, 203-205, 2008), a strong correlation between heart attacks and geomagnetic/solar activity has been demonstrated by many studies since the 1970s. But the effect is seasonal (weakest in summer) and is largely restricted to sick people living at higher latitudes with shorter daylengths in winter. This finding is consistent with the seasonal production of the pineal hormone melatonin in response to light levels (lower in winter). Thus melatonin is the main driver of circadian rhythms and is known to affect the incidence of winter depression at higher latitudes. It is also known that magnetic storms can decrease melatonin levels by up to 20% in sick people, but not in healthy people. So we might reasonably suppose that melatonin can affect the sensitivity to magnetic storms and geomagnetic pulsations generally. But less reasonably uterine contractions during labour. The absence here of a plausible mechanism is not helpful.

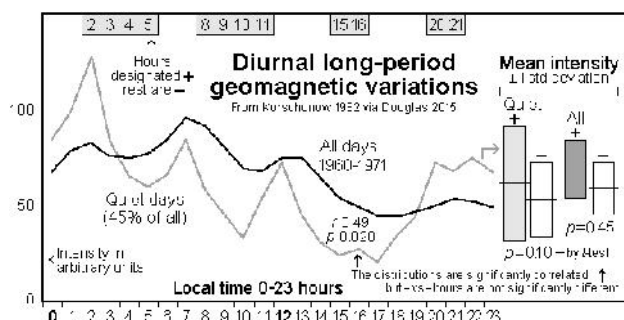
Nor is it clear how essentially the same geomagnetic pulsations could explain five different planetary effects (Moon, Venus, Mars, Jupiter, Saturn), or involve only the birth of people destined to be eminent. Also to establish whether a link between conception and eminence exists would require measuring geomagnetic activity at a normally unknown time for enough people to allow the collection of enough births who later turn out to be eminent in a given profession (even if the time of intercourse is known, conception may not occur until hours or days later). On Gauquelin's figures only 0.006% of the population are eminent, which means we would need to test around 20 million people to collect, 30-60 years later, 1000 eminent mixed professionals, or say 100 million people to get 1000 in a given profession. Assuming the proportion of successful conceptions was say 1%, then each of 100 million couples might have to be monitored 100 times to catch the single happy event. The chances do not seem good.

Back at Douglas's conception hypothesis, it requires clear peaks in sports champion births when heliocentric Earth-Mars aspects of 0° and 180° exist 267 days before birth (267 is the mean gestation period timed by biochemical tests, sd 10 days, range ± 35 days, Jukic et al, *Human Reproduction* 28(10), 2848-2855, 2013). But the relevant plots are not encouraging:



Top: Physicians (the second strongest of the Mars professions) show a modest peak at 0° ($p=0.020$ by χ^2) but none at 180°. **Bottom:** For sports champions (Douglas's target group) the results may seem vaguely similar but they correlate with physicians no better than chance ($r = 0.081$, $df = 34$, $p = 0.64$). Indeed the strongest peak at 290° is missing from the physicians' group. **Conclusion:** There is no unambiguous support for Douglas's hypothesis.

Although the Pc5 geomagnetic pulsations show four peaks a day they do not differ sufficiently in intensity between Douglas's designated + and – birth hours to support the claimed link:



Plotted here is the mean diurnal variation in Pc5 geomagnetic pulsations as reported by Douglas. The grey boxes at the top show the birth hours designated +. The remaining hours are –.

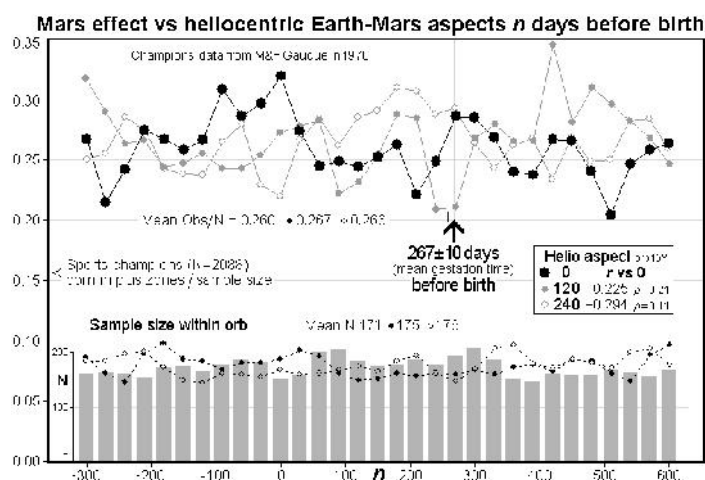
Right: The mean geomagnetic intensity during + hours is not significantly different from the mean during – hours, which shows that tests involving such hours (which Douglas says demonstrate a link with conception) cannot reliably reflect variations in geomagnetic intensity. So they cannot reliably demonstrate the claimed link, nor one between solar activity and birth hour.

Nevertheless if a link does exist between conception and the Mars effect, the actual Mars effect (as opposed to the number of births as in the plot on previous page) should be related to helio



Earth-Mars conjunctions. Douglas does not specifically report such a test, but the results are not encouraging:

◀ Does a Mars effect arise when conception occurs around the time of a helio Earth-Mars conjunction? We can test this by taking each birth back n days and calculating the Mars effect for those within orb of a helio Earth-Mars conjunction. If this is relevant, there should be a clear peak in the Mars effect around n = average gestation time.



Here n varies from –300 to +600 days before birth in steps of 30 days (0.082 year) for a heliocentric orb of $\pm 15^\circ$ (or ± 0.089 year). As a control the span is extra wide and the ineffective 120° and 240° aspects are included. Heliocentric Earth-Mars conjunctions are not totally regular but average about 2.13 years apart. About 98.5% of the 2088 sports champions were born during 1871-1941, which included 33 helio conjunctions.

Look at the big black dots. They are all over the place, as are the grey = 120° and 240° aspects. **Conclusion:** There is nothing special about conjunctions, no unique peak around 267 days, and no reduction in Mars effect away from it as required by the hypothesis.

In other words the above test reveals no hint of the claimed conception effect. If a conception effect does exist it seems to be too weak to warrant practical consideration.

Finally Douglas ignores a more plausible reason for the modern decline in planetary effects, namely social effects. They include an ability not shared by a birth effect or a conception effect to explain every Gauquelin puzzle (see 6.13.1) even though they are precisely that testable theory of planetary effects which he says does not exist.

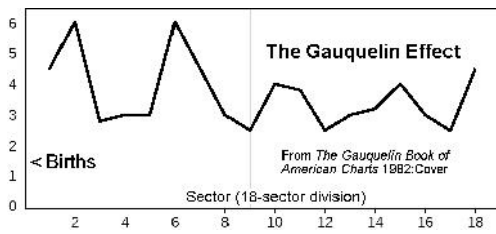
7.5.2017.1 Add Neptune for a bigger stronger Mars effect

Phil Stanway. Articles on www.cura.fr: Mars effect 2014. Solar activity and Parisians 2017a. True Mars effect 2017b.

Stanway's starting point is this statement:

According to astrology the first planet to rise after birth is a guide to the child's temperament and abilities (2014:2).

Comment This seems like a speculative interpretation of the traditional emphasis on the first house and angular planets. Ptolemy might agree – he says "we must in general observe the eastern horizon and the planets that are upon it or assume its rulerships", *Tetrabiblos* Book 3.11 Of bodily form and temperament. **End of comment**



Gauquelin tested the idea by counting planetary positions at birth, with results like these for Mars and sports champions from the cover of his *The Gauquelin Book of American Charts* 1982:

They seemed to find that planets are most often by the eastern horizon and mid-heaven but also often by the western horizon and mid-earth (2017b:2).

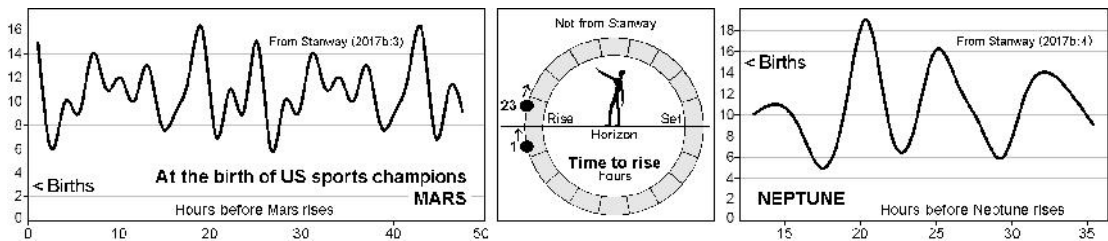
Looking at the above plot, Stanway asks these questions:

There are four crests at nearly regular intervals, so is the remaining irregularity due to the timing itself or the method of measurement? (2017b:2). [The waves] are not all equally big or in a rising or falling series. Might the two big crests be due to a pair of planets, one of them being Mars? (2017b:3).

It seemed to him that, given his own emphasis on the first planet to rise after birth, the two main crests might be due to two different planets. At an unidentified astrology conference in Berlin he mentioned his idea to an unidentified German professor, whose reply indicated that:

he had thought of that and checked, but only Mars was involved. [When Stanway later wrote to him with more details] the professor wrote back saying he would be happy never to hear from Stanway again (2017a:5).

Stanway then checked the sports champions listed in *The Gauquelin Book of American Charts*, plotting the number of cases against the time it would take at birth for Mars to exactly rise, and found a regular series of waves. There were also regular waves for Neptune:

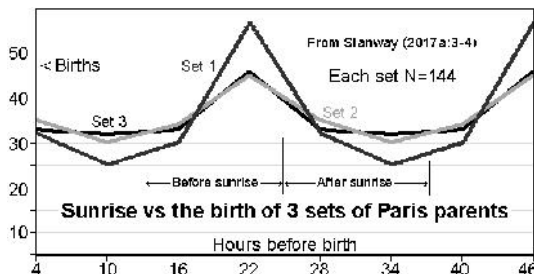


Comment Stanway does not indicate the sample size (but presumably $N=350$, the number of US sports champions listed in *The Gauquelin Book of American Charts*), or the birth time precision, or the original data points, or how they were smoothed. Nor does he indicate why the second planet is Neptune rather than another outer planet, or why the horizontal axis in his plots should exceed 24 hours (but the duplication $24-48 = 0-24$ does help to identify peaks).

Stanway concludes that the birth of US sports champions is timed by two planets:

In other words the Gauquelin effect [for Mars] is a rare variant, not the norm, and the chance presence of an auxiliary [ie Neptune] changes a person's aptitude for a lifetime. Apparently the US sportsmen had an inherited leaning towards Neptune, but the ethnic French had to acquire one. Turning to top professionals revealed the rare variant, so turning to common Parisians may confirm the revealed norm (2017b:4).

His common Parisians were 3 sets of 144 parents (husbands and wives) taken from the 1966



Gauquelin heredity data in order of birth date, oldest first. The median birth years were 1884, 1889, 1892. Stanway applied the same test as before but this time the planet was not Mars or Neptune but the Sun. Here are the results:

All three sets show a reproducible peak in births, with more births occurring before sunrise than after sunrise. The p values for sets 1, 2, 3 (by an unidentified method, expectancy and df) are said to be 0.0026, 0.37, 0.36.

Comment This seems to be a complicated way of saying what we already know, namely that Gauquelin births (like all spontaneous births) show a broad peak around 3 am. Unfortunately Stanway's articles are characterised by tiny sample sizes, little reference to existing studies, an absence of crucial details, breathtaking confidence, and inattention to likely statistical and

other artifacts. For example the absence of original data points, method of smoothing, and sample size provide strong reasons for suspecting Stanway's conclusions based on the curves in the second figure above. Similarly the alleged effect of Neptune would seem to require it to be in a long-term conjunction with Mars, which is precisely not the case. Nor did a Neptune effect show up in independent tests, see 7.5.1987.2. The adverse opinion of the unidentified German professor (presumably Ertel) seems easy to understand.

Veteran US astrologer April Elliot Kent (www.bigskyastrology.com/) disagrees that the first planet to rise after birth is a guide to the child's temperament and abilities. Instead she claims it shows how the person reacts to anything new or unexpected. It is distinct from the ruler of the rising sign, said to be the chart's most powerful planet and roughly equal in influence to the rising sign itself. Here are her (abridged) meanings for the five G planets and Neptune if they are first to rise after birth, all reflecting speculations based on traditional ideas without adequate empirical evidence. Do they show how *you* react to anything new or unexpected?

Moon: you react to its emotional content.

Jupiter: you react philosophically.

Venus: you react with charm and courtesy.

Saturn: you react cautiously and reluctantly.

Mars: you react quickly and make things happen.

Neptune: you react receptively.

7.5.2017.2 Is the Mars effect an aspect effect in disguise?

Kyösti Tarvainen and Vincent Godbout. Article submitted to *Correlation* in 2017 with a copy kindly sent to us. Here including a later article Evaluating the effect of rounding errors in the Gauquelin data, *Correlation* 32(2), 69-74, 2020.

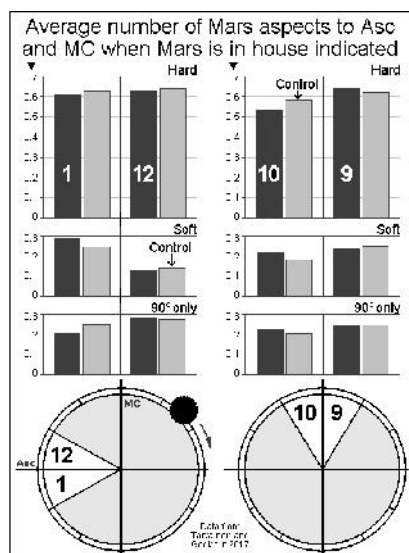
One long-standing problem astrologers have with Gauquelin's Mars effect is the preference for weak positions rather than strong. Here's a thought: Could it be because Mars in traditionally weak positions (9th and 12th house) makes more aspects to the Ascendant and MC than Mars in traditionally strong positions (10th and 1st house)?

To find out, the authors counted the number of 0, 30, 45, 60, 90, 120, 135, 150, 180 aspects made by Mars to the Ascendant and MC when it was in the specified Placidus house for 2144 eminent sports champions and 13,832,000 controls prepared by shuffling the combined birth

data for eight professional groups (N=13832) a total of 1000 times. The orb was 8° except 4° for 60 and 2° for 30, 45, 135, 150. More shuffling did not appreciably change the results for the control group. 135 aspects were rarely found, 150 and 180 aspects did not occur.

For the analysis 60 and 120 were counted as soft aspects. The rest were counted as hard aspects.

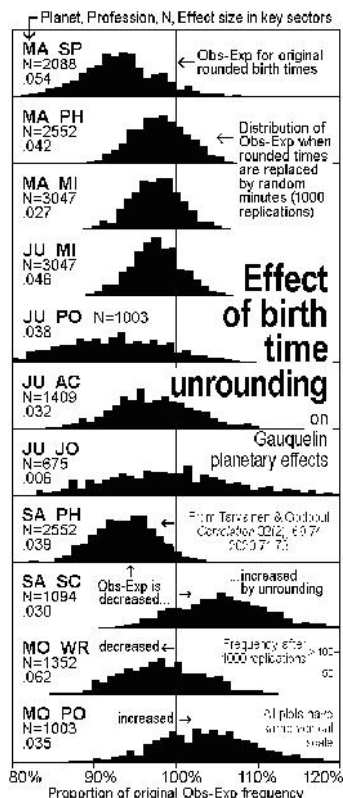
Rising positions are on the **left** labeled 1 and 12, culminating positions are on the **right** labeled 10 and 9. If the authors' suspicion is correct, traditionally weak positions should score more than traditionally strong ones (ie the 2nd should > 1st of each horizontal pair of black columns).



Comment The authors present their results as several multiple tables and claim that hard aspects show strong support for their suspicion. But when their tables are converted to graphs to facilitate comparison, the support is only marginally true for 1 and 12 (look at top row), although somewhat clearer for 10 and 9.

The authors single out 90° aspects as being decisive "in line with the common experience of astrologers" that hard aspects are more energetic and contribute more to success (a view that Charles Carter in *Astrological Aspects* 1972:7-17 could find exceptions to). But the bottom row shows the results are not notably clearer. Indeed, whatever difference (1 vs 12 and 10 vs 9) is true of the sports champions is also consistently true of the controls, which makes the exercise suspect and might deny any special relevance to sports champions. **End of comment.**

The authors estimated the effect of *birth time rounding* in the Gauquelin data (on average 70% of professional birth times are reported in whole hours) by comparing the house distribution of Mars for 2144 sports champions using their estimated reported times vs randomised birth times repeated 100 times. (The reported times had to be estimated from the corrected-for-local-time data on the cura.free.fr website, which does not give the actual reported times from the original Gauquelin publications). The results indicated that the use of rounded birth times may lead to small errors in sector counts of a few percent, which was generally of little consequence because the mean observed surplus or deficit in key sectors is around 15%.



Their later 2020 study replaced rounded birth minutes with random (but evenly generated) birth minutes with 1000 replications. The resulting plots of Obs-Exp frequencies in key sectors showed that some increased, some decreased (see bottom four for examples), but for professional groups as a whole, "the errors due to rounding cancel each other significantly" (p.69).

Back at aspects, their results for all planets in shuffled data suggested that a planet in 9th house has 20% more square aspects to the Ascendant than the same planet in 10th house (for Mars and 2144 sports champions it was 12%), while a planet in 12th house has about 10% more square aspects to the MC than the same planet in 1st house (for Mars it was 11%). They conclude that the above observations provide a possible explanation for Gauquelin planetary effects

Comment But unless there is strong replicated evidence for the validity of such aspects, an explanation based on *aspects by Mars* is no more an explanation than *Mars in key sectors*. In any

case it does not explain why there is no clear evidence for Mars-planet aspects, see 6.6.3, or why only eminent people show planetary effects given the argument that "the common experience of astrologers" is that aspects work for most people. Nor does its prediction (by extension) of equally large planetary effects in opposite sectors appear supported, see 6.12.7.

The idea that house position affects planetary aspects to the angles is nothing new, but its precise evaluation is a valuable advance, although caution is required. For example the control group showed the following average number of conjunctions to the Asc and MC:

Mars house position	1st	12th	10th	9th
Av conjunctions with Asc and MC	0.282	0.274	0.261	0.265

The difference between each pair is trivial. So Mars actually close to conjunction with Asc or MC will not be biased either way. Which means that bias can arise only from counting aspects other than the conjunction and opposition, whose impact will depend on their orb and relative importance – points on which the astrological literature is in total disagreement. Although the importance of angularity (ie being conjunct the Asc-Desc axis or MC-IC axis) is marked by exceptional agreement, and:

is one of the oldest, most fundamental, and least disputed of astrological concepts (*Recent Advances* 1977:371),

the relevance of aspects other than the conjunction is marked by total disagreement:

Opinions are divided on the validity of aspects other than conjunction and opposition to the angles, and on which kind of aspect (zodiacal or mundane) has the greater validity (p.373).

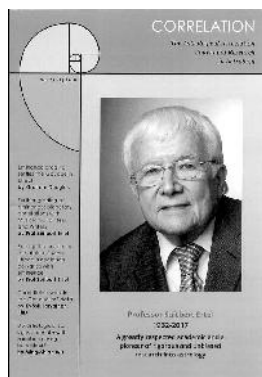
Unsurprisingly there is also total disagreement on the kind of aspect, their orbs, how they should be interpreted, and on whether other points should be included. So once the diurnal researcher leaves the conjunction, the number of variables explodes and everything dissolves into endless speculation. Especially if the variables chosen ignore those explored in 6.9.

7.5.2018.1 Tributes to Suitbert Ertel 1932-2017

Recollections from friends and colleagues. *Correlation* 31(2), 11-15, 2018

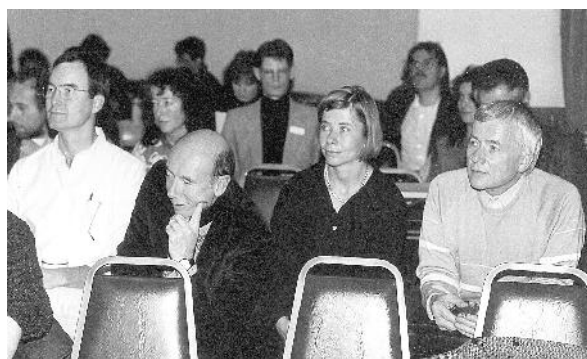
From Nicholas Campion. Suitbert Ertel was a great scholar and a courteous and generous gentleman. His manner was quiet and self-effacing, but it takes quite a lot of courage to examine the claims of astrology, still more to publish positive results. There are some academics who regard it as wrong in principle to investigate the claims of astrology, and still worse to publish positive results, and will vilify those who do. Suitbert ignored such pressures and was prepared to let the science lead him in his quest for knowledge. He caused ripples by contesting some of the Gauquelin findings, but confirmed other results. This is exactly as it should be: science without fear or favour. For me it was a privilege to know him.

From Jan Ruis, Frank Vernooij, Hans van Oosterhout, NVWOA Members. We have received the sad news of Suitbert Ertel's death. When some one so well-known leaves us this is always a sad event, but this is the man who, with Michel and Françoise Gauquelin and Geoffrey Dean, marked the era of scientific research into astrology of the last few decades. There are and will be new researchers to carry on the work according to the scientific criteria of today, but during the past few decades, Ertel has been among the most outstanding. ... We remember him for his important contribution to statistical research, in particular the problem of how to create dependable reference groups, and for his valuable comments on all kinds of astrological research.



But above all we remember his great work: checking, together with the Gauquelins and Dean, the repeatedly replicated empirical results which are known as the Mars effect, although they are not limited to Mars alone. Were these results really methodologically sound? It turned out that they were, not least due to Ertel's work and despite the repeated denials from the side of skeptics. Ertel's demonstration of the eminence effect has brought considerable support to the soundness of the results of the Gauquelins. In 2000, Dean explored an alternative approach, which explained the Gauquelin results as possibly caused by psychological and sociological factors. Ertel was and remained strongly opposed to these arguments. We are grateful to Ertel for his efforts for the benefit of research into astrology.

From Geoffrey Dean. Suitbert's lasting legacy is of course his work on Gauquelin's planetary effects. This picture shows them in November 1987 at the 6th London Research Conference, which in those days lasted two days and allowed them ample chance to confer in person.



On Michel's left is Katherine, his new wife, on his right is Tom Shanks of ACS, with whom he worked in San Diego to computer-analyse his data.

But Suitbert was unrelenting in his criticism, which later led to both Rudolf Smit and myself receiving an anguished letter from Michel dated 21 March 1991 complaining about Suitbert: "it is the first time in my life that I am called a cheater".

Over two decades (mostly 1987–2006), Suitbert contributed more than 35 articles and letters to *Correlation*, including a very complete 13-page listing in 1991 of Michel's 150 planetary-effect publications. In his earliest publications Suitbert was the first *Correlation* author to feature computer-drawn graphs (one of the perks of his university position was access to the latest technology), whose sparse elegance duly improved as the available software improved.

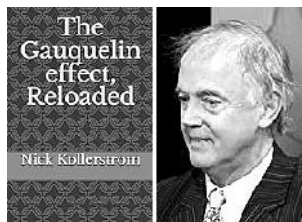


Later we came to what *Correlation* readers might see as violent disagreement over my empirical findings, but scientists are like that, at least on paper. In person our relationship remained cordial and eager to discuss planetary matters regardless of the location, as shown by this photo of us taken by Rudolf Smit (who in 1996 typeset *The Tenacious Mars Effect*) on a freezing winter's day in a London park en route to visit Eysenck at the Institute of Psychiatry. I will always remember with gratitude Suitbert's unceasing innovations, his persistence, his attention to detail, his helpfulness, and his faith in science when faced with unreasoning skeptic hostility. His sad passing marks the end of an era.

From Nick Kollerstrom. Without Suitbert, the sceptics would have destroyed the Gauquelin's work. He rescued it, without a doubt. A quietly spoken man, he had a somewhat calm, detached attitude, and would design ways of testing the various claims. As a psychology professor, he could call upon his students to assist him, and thereby achieve a more detached position for evaluating the great work. His work on psychology always seemed to have some interesting twist to it, eg he investigated some claims of parapsychology, and I once heard him give a paper about how grand endeavours corresponded with sunspot maxima. But undoubtedly he will be remembered by astrologers for his work on the Gauquelin endeavour. It is hard to believe or recall now how great a debate there was towards the end of the 20th century on the Mars effect ... but Suitbert was certainly at the centre of it.

7.5.2019.1 Planetary effects: a valid branch of psychology?

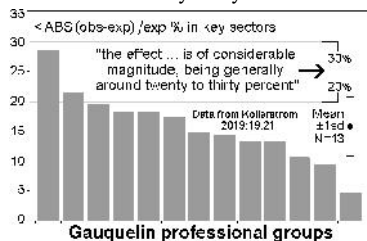
Nick Kollerstrom. *The Gauquelin effect, Reloaded* 2019, 260 pp, a work supported by an unacknowledged £1500 grant from the Urania Trust. The author's links with astrology and AA activities go back to the early 1970s. As a historian of astronomy he has published important works on Galileo, Kepler and Newton. But he has also published works that flatly deny the Holocaust (thus Auschwitz had art classes, orchestras, a library, theatre, cinema, and a swimming pool where inmates would sunbathe and watch water polo – which resulted in London's University College cancelling his honorary fellowship in April 2008), and similar others including ones that attribute the 9/11 New York terrorist attack and the 7 July 2005 London bombings to government forces, all of which have been described as the "uncritical gulping down of utterly discredited sources".



Dr Kollerstrom wants to revive the Gauquelin work for the benefit of humanity. He claims it: could become a valid branch of human psychology indicating a heavenly connection of human destiny (back cover).

After more than 200 pages in which he selectively surveys published work, he concludes:

An opportunity here lies in wait, of re-evaluating a wondrous new science in-between Heaven and Earth: one indicating that human destiny does have some innate celestial connection. And the results here described do somewhat strain our credulity: they do so because they are so large, they are far stronger than they ought to be! (conclusion).



Which creates problems for his celestial connections:

He dismisses their tiny effect sizes (see 6.4.7) because they disagree with what he sees as the large key sector differences for Gauquelin's professionals of "generally around twenty to thirty percent". Which (apart from being misleading because it ignores most of the sample and all non-eminent persons), is about twice what his own tabulated frequencies show. The closest he gets to mentioning proper effect sizes is to quote the 2nd plot in 6.12.3 of heredity phi values, wrongly dismissing their calculation as unexplained.

Having inflated his target data, Kollerstrom ignores most of the research that might impede his crusade. For example there is no hint of social effects (6.10), no hint that harmonics don't replicate (7.7.1977.1), no hint that self-attribution "the only positive astrological effect ever published" was an artifact (8.3.7), and every hint that his views of Ertel's work (see the above tribute) have changed. His declared aim is to facilitate "a future psychology course" in which students "can have fun checking the data", as if his failing to mention the whole picture was unproblematic. Altogether a worthy astrological extension to his Holocaust writings.

7.6 PERSONALITY Includes all studies that involve personality questionnaires.

7.6.1932.1 Testing four chart readings for *Koralle* magazine

H Korsch, *Das Experiment der Koralle. Zenit* 3, 298, 1932 through 5, 276-279, 1934. Plus a later summary by HC Freisleben *Trugen die Sterne? Werden und Wesen der Astrologie* 1963:109-111. Dr Korsch, a lawyer, was permanently at war with entrenched beliefs. To him astrology was a science in need of proper testing.



ZENIT
Zentralblatt für
astrologische Forschung
Organ der Astrologischen Zentralstelle E. V.
Sitz Düsseldorf
Herausgeber und verantwortlicher Schriftleiter:
Dr. jur. Hubert Korsch, Düsseldorf

VI. Jahrgang

April 1935

Heft 4

Zenit's title page. Sub-headings are "Central Office for Astrological Research" and "Organ of the Central Astrological Office", which Korsch had turned into a German society for individual astrologers. He was founder, owner and editor of *Zenit*, which was subsidised by a wealthy businessman (*Urania's Children* 1967:105).

Since antiquity the same wrong beliefs against astrology have been repeated with astonishing tenacity, for example

similar charts can have different fates, and different charts can have similar fates. But it is not possible to change wrong beliefs by logical argument. Factual proof is desirable, especially since the statistical results of von Klöckler are inconclusive.

In May 1932 the German popular science magazine *Koralle* had published an essay "Twisted Truths Bad Times" that upset astrologers. The editors had received many letters of complaint. So the July 1932 issue invited astrologers to send in their readings of the birth chart of a male born 17 October 1890 in Berlin at 8am. The mother's birthday and anniversary of the father's death were provided. The readings would be assessed jointly by an astrologer, a psychologist, the subject, and the editors. The outcome was 69 readings of such poor quality that only eight were acceptable for assessment. But even then the points they covered were so different in number that even a simple point-score (hit, miss, undecided) could not be used. The experiment was a failure. But it had provided useful experience.

So a second experiment was published. It involved four birth charts, and each participating astrologer had to use each chart to answer pre-set questions about its owner. There were 40 questions about character, each with typically four sub-questions. For example is the mind clear, erratic, superficial, or confused? Is the predominant mood choleric, phlegmatic, sanguine, or melancholic? There were 36 questions about life events such as health, enemies, and foreign travel. Both sets of questions were also answered by the chart's owner, a close friend, and a psychologist.

Special attention was paid to birth time accuracy. Four sources of error were identified: (1) Rounding to the quarter-hour. (2) Unreliable memory. (3) Uncertainty between physical and astrological birth time. (4) "Desire for a certain birthday therefore the avoidance of a given day". For example it was discovered that one of the subjects, said to be born on the 14th, had in fact been born just before midnight on the "ominous 13th". But the father "not wishing to tarnish the joy of the mother ... sat with the midwife in a harmless deception until the desired 14th could be recorded" (*Zenit* 5, 178-179, 1934:178).

But the response by astrologers was poor even after extending the deadline – just 19 responses for a total of 4 charts giving a total of 970 answers for assessment. The answers were judged in two ways: (1) Overall % hits. (2) Mean score based on scoring each answer from very accurate (+10) to very inaccurate (–10), so a neutral answer is 0 points. The outcomes were:

(1) Character 67% hits for 740 statements. Events 47% hits for 230 statements.

(2) Character averaged 4.3 points. Events averaged 2.7 points.

However, without knowing the hits expected by chance the outcomes could not be evaluated. So the experiment was repeated using answers determined in three ways – by throwing dice,

by base rate (answers given by the average person), and by the subject and a close friend. But because event outcomes were so poor compared with character outcomes, only character outcomes were reported, and even then only as ranges for 25 (not 40) character questions:

Answers are via	Range of scores and % hits for character	
Throwing dice	3.0	(40%)
Base rate	3.1-3.8	(40-45%)
Subject and close friend	2.7-4.3	(68-95%)*

*These high rates are "very understandable ... as a complete misunderstanding of many sides of the character was almost impossible"

The earlier outcomes now seem favourable to astrology. But a sample of four charts is too small to be convincing. Indeed, although it was agreed that the experiment be controlled by a team of astrologers, the editor of *Koralle* felt that the team disagreed too much with itself to allow a plausible joint report. Later, in October 1933, he published his own assessment (which was negative) under the heading "Is astrology to be taken seriously?".

Comment Today we can see how the experiments were almost doomed to be inconclusive due to too few charts, difficult questions, and disputes among organisers. But they illustrate the challenges being faced. The poor performance of events compared with character suggests that hidden persuaders are active, so appropriate controls are essential.

7.6.1952.1 Jung's astrological experiment on 483 marriages

CG Jung, An astrological experiment. *The Collected Works of CG Jung* Volume 8, 1960:459-484. Also *Synchronicity: an acausal connecting principle* 1955, first published in German 1952. Quoted paragraphs are from *Collected Works*. Includes material from *Correlation* 14(1), 15-25, 1995. 14(2), 12-22, 1995. 15(1), 17-52, 1996:29-32. Jung devised his experiment as a test of synchronicity, not of astrology. Synchronicity is often quoted in support of astrology but as defined by Jung it arguably does not support astrology (see below), a point that has generally escaped attention.

Before synchronicity there was Jung's idea of qualitative time, given in his famous quote:

It seems ... as though time, far from being an abstraction, is a concrete continuum which contains qualities or basic conditions manifesting themselves simultaneously in various places ... In other words, whatever is born or done in this moment of time has the quality of this moment of time (in Wilhelm, *The Secret of the Golden Flower* 1931:154).

The idea was easily disproved by observing that dice tossed simultaneously did not show identical faces better than chance. Then came Jung's idea of synchronicity, which he stresses:

explains nothing, it simply formulates the occurrence of meaningful coincidences (para 995) ... [which] seem to rest on an archetypal foundation. At least all the cases in my experience ... show this characteristic (para 846).

Jung defines an *archetypal situation* as any strongly emotional crisis such as an accident. It is:

not evoked by a conscious act of the will; ... [people] find themselves compelled by fear to utter a fervent prayer: the archetype ... is constellated by their submission and may eventually intervene (*Letters* Volume 2 1976:541).

In other words synchronicity is not just a meaningful coincidence between two unconnected events. It requires the observer to have strong crisis-like emotions, and even then it may not appear. If such emotions are absent then synchronicity is unlikely to occur, which leads to problems with synchronicity as support for astrology because: **(1)** It arises from the reader, not the chart. **(2)** It has no clear connection with *as above so below*.

Further problems arise when we ask how coincident is coincident. Jung initially says that the external event must be simultaneous with the internal emotional state (para 850). Later he says that synchronicity requires the emotional state to be coincident with:

a corresponding (more or less) simultaneous external event ... [or even a] not yet existent future event that is distant in time (para 984). ... I call such events *synchronistic*, which is not to be confused with *synchronous* (para 985).

So the simultaneity that astrologers consider essential is actually not essential. Nor can synchronicity relate to the usual happenings between astrologer and client, because archetypes would require the reader to be experiencing intense crisis-like fear, anger, joy, sorrow, love, hatred, or whatever, to become manifest. No reader or client could stand it.

Jung recognised that some kind of test was needed if his idea was to gain credibility, but he rejected using the I Ching or graphology because they involved human character. So he chose astrology because it allowed the "uncertain diagnosis of character" to be replaced by:

an absolutely certain and indubitable fact ... the marriage connection between two persons (para 868).

In due course he obtained three sets of married couples (N=180, 220, 83), saying only that:

The material to be examined, namely a quantity of marriage horoscopes, was obtained from friendly donors in Zurich, London, Rome, and Vienna. Originally the material had been put together for purely astrological purposes, some of it many years ago ... The horoscopes, or rather the birth data, were piled up in chronological order just as the post brought them in. ... The first batch [of 180] was used to conduct a pilot investigation (para 873).

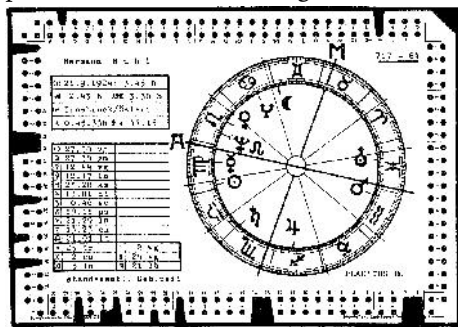
The material had originally been collected "to test the empirical foundations" of astrology (para 874), but Jung says nothing about the possibility of bias in its original selection. Yet:

[the subjects] were obviously interested in astrology [because] they went to the trouble and expense of having their horoscopes cast, [so] in some cases ... the auspices traditionally regarded as favourable by astrology is likely to have entered as one element in the choice of marriage partner (Jahoda, *The Psychology of Superstition* 1969:116).

Jung did not himself conduct his experiment. Instead he got his co-worker Dr Liliane Frey-Rohn to count the conjunctions and oppositions between SO, MO, VE, MA, Asc in one chart and the same in the other, orb 8°, making a total of $5 \times 5 \times 2 = 50$ aspects for each of his married couples, and also for each of $180 \times 179 = 32,220$ unrelated couples. He chose SO, MO, Asc because they were mentioned by Ptolemy (para 869); he included VE, MA only for comparison (para 879); and he excluded aspects other than conjunctions and oppositions to avoid undue complications (para 878n). The 32,220 unrelated couples were created by:

putting the men's horoscopes on one side and the women's on the other, and then combining each of the pairs that happened to lie on top. Care was naturally taken that a real married pair was not accidentally combined (para 896).

Even allowing only two minutes for counting 50 aspects for each pair of charts, it would still take about six months of full-time work. It seems unlikely that Dr Frey-Rohn would have had such time available, always assuming she could survive the tedium in the first place. It is possible that she used edge-notched cards (insert a skewer into the wives' stack at the position



of a given husband, shake, and those in aspect fall away from the stack) which would reduce the time required to about 3 weeks. But Jung does not say how the comparison was made.

Most academics would have been familiar with edge-notched cards, and at least one German astrologer was using them. This example is from the 1958 book by F Arthos, *Das Astrologische Lochkarten-Verfahren* [The astrological punched-card system] page 15. Each card is 11 x 15 cm with 100 pairs of holes around the edges. In this case the card is notched to record event data and an ID (left edge) and planetary positions (bottom edge)

The pilot investigation of 180 married couples gave these results:

Counts for 180 married couples							For 32200 unmarried couples					
Husband >>	SO	MO	VE	MA	AS	Total	SO	MO	VE	MA	AS	
Wife SO-0	2	8	4	12	11	37	1480	1508	1490	1485	1413	**Expected mean per aspect with 8° orbs is $180 \times (2 \times 8) / 360 = 8.0$. If (as is likely) orbs were rounded to 8° making them effectively 8.49° the expected mean is $180 \times (2 \times 8.49) / 360 = 8.5$.
-180	2	5	8	8	9	32	1482	1530	1502	1516	1556	
MO-0	18	13	7	9	14	61	1506	1479	1481	1539	1485	
-180	13	8	6	10	7	44	1438	1548	1576	1540	1539	
VE-0	9	6	5	9	11	40	1526	1436	1497	1498	1409	
-180	8	13	9	8	11	49	1485	1526	1415	1531	1526	
MA-0	6	13	8	13	12	52	1575	1548	1520	1711	1467	
-180	8	7	7	3	11	36	1516	1540	1521	1440	1471	
AS-0	6	8	15	8	9	46	1587	1541	1411	1625	1595	
-180	8	8	11	6	6	39	1398	1543	1470	1433	1328	
Mean	8.0	8.9	8.0	8.6	10.1	**	1499	1520	1488	1532	1479	

Jung says nothing about possible errors in counting such large numbers. He notes only the uneven distribution of counts (left), the emphasis on wife's MO, and lack of emphasis on VE-

MA. According to RK Tsutakawa (*On Jung's Astrological Investigation*, Masters thesis, Dept of Statistics, University of Chicago 1957:10-11) the probability that the maximum count (ie 18) will be ≥ 18 in at least one of the 50 aspects is given approximately by:

$$1 - (1 - p)^{50} = 0.08 \text{ which is non-significant,}$$

where p = binomial probability of getting ≥ 18 aspects of orb 8° in 180 subjects = 0.0016.

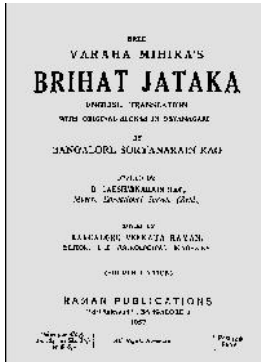
But do they replicate? Jung reports only the top 14 and 4 aspects respectively for his other two sets. N=180 has five ties in 4th place and N=220 has three ties in 4th place, which limits a straightforward check on replication across three sets to the top 3 aspects, which were:

N = 180	N = 220	N = 83	
MO-0-SO	MO-0-MO	AS-0-MO*	*Given as AS-0-MO in para 895 but MO-0-AS in
AS-0-VE	MA-180-VE	SO-0-VE	902, making the total replications either 0 or
MO-0-AS	VE-0-MO	SO-0-MA	1 (N=83 vs N=180) vs 0.54 expected by chance.

Furthermore the top 14 aspects in N=180 and N=220 have only 3 aspects in common, namely MO-0-MO, MO-180-SO, and VE-180-AS vs 3.9 expected. Overall there is no clear evidence that the results replicate – and there is still the suspicion of biased samples. Whatever the true situation may be, independent replications have failed to confirm Jung's findings, see 8.4.4.

7.6.1957.1 Ancient Indian astrological aphorisms

Varahamihira's *Brihat Jataka* [Natal Horoscopy], English translation by BS Rao revised by BL Rao, 639 pages, 4th edn 1957 (5th edn 1986 is a reprint). Varahamihira (499-587) was an Indian astronomer, mathematician and astrologer whose *Brihat Jataka* is generally seen as India's foremost astrological text. It contains nothing transcendental or extra-sensory. It has many translations and is of interest here for its (indirect) relevance to how astrology was discovered.



In his preface BL Rao explains why *Brihat Jataka* is so important:

Astrology is a Science and it is very old. The Hindus are the oldest surviving nation in the world and Astrology is their oldest science. ... *Brihat Jataka* from time immemorial has been considered as the standard text-book on Astrology and all other works like *Jataka Chandrika*, *Sarvartha Chintamani*, etc., come only next to *Brihat Jataka*.

But translation of Varahamihira's ambiguous style was not easy:

This is a monumental work, where the difficulties in translating a beautiful, technical and suggestive work in Sanskrit had to be surmounted by hard labour, profound research, want of adequate expressions in a poor and non-constructive language like the English ... and by laborious mental analysis. [To my readers] their intellects will be sharpened and their knowledge will be expanded (written by BS Rao in 1919).

The text is largely composed of aphorisms (short sayings that like a proverb express a truth) such as these from the section on two-planet combinations, where if the Sun conjoins:

with the Moon, the person will be skilled in machinery and masonry;
if with Mars, fond of sinful deeds;
if with Mercury, skilful, intelligent, renowned and happy;
if with Jupiter, he will be cruel and always doing other's work;
if with Venus, he will make money on stage and by weapons;
and if with Saturn, he will be skilful in working ores or earthenware (p.380).

Brihat Jataka contains more than 400 collective aphorisms like this one, each of them usually containing a number of individual aphorisms. In this particular translation there are always careful explanatory notes provided by BL Rao, as in the following example:

Venus with Saturn gives a man small eyes, wealth from depending upon some females, artistic capacity, ordinary writing and painting. Similarly results of combinations of more than two planets must be made out.

NOTES. The last part requires some further explanation. Varahamihira true to his motto of writing little and suggesting much, asks the reader to make out results similarly for larger combinations. Suppose the Sun, Moon and Mars are together in one house. Then we have to take out the results [aphorisms] of the conjunction of (1) the Sun with the Moon, (2) the Sun with Mars, and (3) the Moon with Mars. Suppose there are two planets in one house and three planets in another house. Then all the results mentioned here must be traced out according to their relative strength. Suppose there are 4 planets in one house, viz., the Sun, Moon, Mars and Mercury. As above suggested, conjunctive results for all these must be made out (pp.386-387).

By which he means simply listing the aphorisms side by side, explaining later that:

In all these cases the general principles of astrology, viz., the sources of strength and weakness affecting these planets must not be forgotten in making predictions ... Suppose Gemini is rising and Moon is in Taurus. Here he [MO] is exalted and good. But suppose he is in Scorpio debilitated and Sagittarius is rising. In both these cases Moon is in 12th house from birth and the student must make a difference in predicting results suitable to these places (pp.444-445).

Comment But no worked examples are given. In effect *Brihat Jakata* is just another cookbook of the kind despised by Western astrologers, driven by complexity and by profits for its users. Dr S Balachandra Rao, a former professor of mathematics, makes this comment in his critical review of Hindu astrology *Astrology Believe it or Not?* published in 2000/2008:

In fact [today's] predictive astrology is based only on certain "rules" prescribed in the ancient astrological treatises like those of Parashara and Varahamihira. Even among these rules there are many which often clash and contradict each other. ... The ancient savants of *Jyotisha shastra* like Parashara, Jaimini and Varahamihira are, no doubt, great scholars and their works are highly respectable. The achievements of some of them in Indian Astronomy are indeed a matter of pride for us. But when it comes to the predictive side of astrology the rules set by these savants very much require testing on the anvil of scientific verifiability (p.11).

More to the point, it is clear that such aphorisms could never be based on observation, a point discussed further via another BS Rao work in 3.5 (discovery of Hindu astrology).

7.6.1971.1 Transiting planets in natal houses at 430 marriages

Mamie D Jylha, *AFA Bulletin* 33(5), 21-32, 1971. House system is not stated but an example chart matches Placidus.

As part of an astrological survey of returned US servicemen made in 1945-1946. the author collected timed birth data for 392 women who had recorded a total of 430 marriages. Some had married twice, a few had married three times. The house positions of transiting planets (excluding Moon and Mercury) in the wife's birth chart on the date of marriage were:

Trnsitng Planet	House											
	1	2	3	4	5	6	7	8	9	10	11	12
Venus	34	35	38	32	39	32	35	35	38	34	43	35
Mars	41	33	23	26	39	32	28	50	45	36	38	39
Jupiter	38	27	31	28	30	38	42	39	38	40	47	32
Saturn	38	35	25	42	25	30	47	33	44	44	39	28
Uranus	37	34	35	30	34	27	39	52	39	39	31	33
Neptune	33	38	25	24	24	33	55	34	40	31	42	51
Pluto	21	18	19	27	37	40	42	35	44	53	48	46
	----- 1327 -----					----- 1683 -----						
Total	242	220	196	209	228	232	288	278	288	277	288	264
	Sub totals											
	Total 3100											

The traditional emphasis of Venus and Mars in 7th house is not confirmed, although the rest tend to be highest in 7th, 9th and 11th. The author saw the general emphasis on houses 7-12 compared with 1-6 as confirming the former's traditional emphasis on collective matters vs the latter's traditional emphasis on personal matters.

Comment 1 Nice try, but an emphasis on houses 7-12 is inevitable due to the preference for weddings in the warmer months, which necessarily have more hours of daylight and therefore more opportunity for transits to appear in houses that are above the horizon, namely 7-12. Had the author applied a chi-squared test to her results, she would have found that the very high significance of variations over the full 7 planets x 12 houses distribution ($p=0.00010$ $df=82$) disappears when divided into below horizon and above horizon results ($p=0.13$ $df=40$ and $p=0.22$ $df=40$ respectively). Transits to houses are not significantly related to marriage.

The author also determined the house position at marriage of the progressed Moon, this time after dividing her 430 marriages into two subgroups:

Number of marriages	Placidus House											
	1	2	3	4	5	6	7	8	9	10	11	12
174	20	14	14	10	12	18	22	14	10	13	14	13
256	14	16	27	18	23	26	27	20	32	17	17	19

The author notes that the above figures seem to focus on cadent houses 3, 6 and 9, "held to indicate a dispersion of ideas and energies", and therefore supporting an effect at marriage.

Comment 2 The correlation between the two subgroups is $r = -0.026$. So regardless of what the subgroups are supposed to indicate, it does not replicate, not even slightly. The author has shown only how easy it is to see nonexistent faces in clouds of figures.

Comment 3 US researcher Donald Bradley claimed that the lunar return (a chart for when the Moon returns to its natal position after a sidereal lunar month averaging 27.3 days) was probably the chief determiner of events in people's lives. In his article "Weddings by Starlight" (*Horoscope* June 1956:5-10), he claims that one of the more pronounced examples of this is:

the uncanny accuracy with which engaged couples set a future date for their weddings – a date apparently chosen for convenience alone – which, from the standpoint of astrological symbolism, will have been a "typical marriage date" whether it had been planned in advance or not! (p.6).

He then cites the lunar returns of 60 wedding charts of men in which transiting Jupiter was especially strong in 10th house, where "the planet of ceremony and jubilation in such an elevated position is lucidly descriptive of a wedding celebration" (p.7). But his small sample size, lack of details, lack of controls, and Jylha's results count against his wedding claim.

7.6.1973.1 Replicating null results with 196 subjects

Nicholas Hume MA, thesis *An examination of potential correlation between abnormal personality and planetary position*, University of Kansas. A systematic investigation of chart factors using accepted personality tests.

The author notes that the majority of past studies do not address the full range of chart factors routinely used by astrologers. But what exactly is the full range? Where to draw the line?

A total of 196 subjects (46% males) with time, date and place of birth and 18-26 years old (restricted to avoid erroneous significance) completed the MMPI and Interpersonal Check List. To avoid too many variables, the responses were converted to scores on two scales (dominant-submissive and friendly-hostile), from which three groups were created for each scale:

Low: scores more than one standard deviation below mean.
 High: scores more than one standard deviation above mean.
 Control: scores less than one standard deviation from the mean.

The high and low groups were then compared with controls for the distribution of ten planets and Asc in tropical signs and elements; the same in sidereal signs and elements; the same in houses; and number of major aspects orb 5°; a total of 625 comparisons. The aim was to see if anything stood out. Because existing research had generally failed to support astrological claims, the author predicted he would find nothing that was better than chance expectancy. In due course he concluded: "The results of this study ... confirmed this prediction" (p.56).

7.6.1975.1 Astrology versus 16 PF and EPI for 94 subjects

Ira Levin, *An empirical investigation into the astrological assessment of personality*. MS thesis, Illinois Institute of Technology.

16PF and EPI scores were used to dichotomise students and acquaintances aged 19-68 (all with accurate birth data, 59% were female) into extraverts and introverts (N = 48 and 40 respectively). The results were compared with the same dichotomy based on signs (SO MO AS), plus angular planets (MA JU UR = E+, SA NE PL = E-), plus planetary aspects to AS, plus (if inconclusive) planets in signs. Astrology correctly classified 77% of cases vs 50% expected, effect size $\phi = 0.55$.

Comment A great result for astrology, except it could be due to self-attribution whose importance had yet to be discovered. But with no controls and not enough details, who knows?

7.6.1976.1 Begone astrologers! (or win Rs100,000)

Dr Abraham T Koor, *Begone Godmen! Encounters with Spiritual Frauds*, Bombay 1976, a best-seller still in print. Koor (1898-1978) was a professor of botany and President of the Sri Lanka Rationalist Association. For 50 years he investigated all types of paranormal claims, for example by sleeping in haunted houses, visiting cemeteries at night with his wife, and issuing a famous challenge that in 1964 inspired James Randi's own famous challenge.



No Hindu does anything without consulting an astrologer. So Kovoor spent two years learning astrology and palmistry, only to discover their futility. He even named his son Aries after his son's ascendant, but his own chart showed only wrong events. He saw how people were being led astray by false beliefs, so he always selected inauspicious times and bad omens for important life events. Nothing adverse happened except:

My aged mother was in tears for several days because I stepped out on my left foot on my way to wed (p.3). [Wife Acca Kovoor was his constant support until her death in 1974.]

After he retired in 1963 Dr Kovoor began to speak and write about his negative findings, which raised a storm of outrage (including mailings of bad luck charms) from all types of occultist. But he and his wife were untiring in their fight against superstitious beliefs and fraudulent spirituality. Perhaps his most quoted comment is:

He who does not allow his miracles to be investigated is a crook; he who does not have the courage to investigate a miracle is a gullible [sic]; and he who is prepared to believe without verification is a fraud (p.17).

He decided the best way to expose fraud was to offer wagers of Rs1000 (then about \$US60) or more for a fool-proof and fraud-proof demonstration of the claimed phenomena:



To prove astrology is a gamble, I said that I would give the dates of birth, correct to the minute, together with the latitudes and longitudes of places of birth of ten persons. I offered Rs1000 to each astrologer who could tell correctly the sex and date of death, if dead, of the ten persons within a margin of error of 5%. ... To prevent a mad rush of charlatans claiming through newspapers, only to get free publicity, I stipulated a refundable deposit of Rs75 [about \$5] from each contestant. India being a land of Hindus who do everything in their lives only after consulting astrologers, two Indian newspapers undertook to conduct this test on my behalf. B.V.Raman and several other "professors of Astrology" in that country were sent press cuttings of this challenge. But so far, not a single astrologer in any part of the world had the courage to take up my challenge by depositing the minimum of Rs75 (p.4).

He subsequently challenged astrologers throughout India. A few accepted but never showed up. In the meantime he had collected numerous predictions made by eminent astrologers in various countries, but none were more successful than simple chance. So in 1970 he issued his world-famous Rs100,000 challenge, then worth about \$6000 in 1970 US dollars:

"I am prepared to pay an award of one lakh [100,000] Sri Lanka rupees to any one from any part of the world who can demonstrate supernatural or miraculous powers under fraud-proof conditions. This offer will remain open till my death, or till I find the first winner" (p.x). As a precaution every applicant had to deposit Rs1000, refundable if successful, "to keep away those bent on cheap publicity who would only waste my time, money and energy" (p.xi).

His list of miracles included reading the serial number of a hidden currency note, levitating, walking on water, and converting water into petrol or wine. His challenge of ten charts for astrologers still stood. But there were very few applicants, none successful. He concluded:

Although Astrology furnishes no true guide to the characters or fortunes of men, and although its pretensions to science are false, it will continue to flourish as long as there are gullible fools in this world. Astrologers give their clients excuses for the past, praise for the present, and hope for the future (p.45).

Comment After Kovoor's death in 1978 his award was continued by one of Rs100,000 now administered by the Indian Rationalist Association. It remains unclaimed. In 2010 an Indian ex-astrologer Rakesh Anand offered one million Indian rupees (then about \$20,000) to any Indian astrologer who could show under controlled conditions that astrology works, so far with no takers, see 8.8.4. Today more than 20 substantial prizes are offered by skeptic groups around the world, for details Google "List of prizes for evidence of the paranormal".

Interestingly Kovoor describes how in 1966 in southern India he happened to meet an astrologer with a large collection of ancient palm-leaf horoscopes, said to be of every person dead, living, or yet to be born, and written by ancient sages. One of these horoscopes would be his and could be identified either by his birth data or by a parrot picking up a numbered square from hundreds scattered on the ground. He paid for the parrot to pick a number (it was 37),

and the astrologer duly retrieved a crumbling horoscope. But rather than have it read, Kovoov sneakily paid again, whereupon the parrot picked a different number (it was 109). Thus endeth the lesson (pp.46-47). Kovoov does not comment on how a collection of horoscopes for every person dead, living, or yet to be born would require the ground to be scattered with many tens of billions ($>10^{11}$) of squares numbered from 1 to 12+ digits. Even if every square was the size and thickness of a postage stamp, they would cover an area of 100 square metres more than 10 metres deep, plus an extra kilometre or two for the actual horoscopes. Allowing one second to read each number would take 150 years just to reach halfway (always assuming the parrot's longevity, retrieval skills and long-term memory were up to it), a wait that would presumably invalidate the reading. Nobody said Nadi astrology had to be easy.

Nor is it quite as miraculous as some claim. After providing birth details, the client may be asked to return a few days later on the pretext that it will take time to find their horoscope among the thousands held by the astrologer. While the client is away, the astrologer writes the horoscope on a fresh palm leaf and soaks it in a slurry of coconut kernels and mango bark, both of which are rich in tannin. This gives the palm leaf an ancient look (Premanand *et al. Astrology: Science or Ego-Trip?* Published by Indian Skeptics. 1993: 331). Or the client may be exposed to stooges whose subtle questions extract the information to be written on the palm leaf and later revealed, with due expressions of unwitting astonishment – except when by mistake the palm leaf is read for the wrong client (*Indian Skeptic* 9(7), 29-34, 1996).

7.6.1978.1 Astrology versus 16 PF for 155 subjects

JR Noblitt, *Celestial Concomitants of Human Behaviour*. PhD thesis, North Texas State University 1978. "Until recently there has been very little empirical evaluation of the tenets of astrology. A review of the literature shows that some studies found small magnitude but statistically significant correlations between celestial bodies and certain human behaviors. Most of these studies had serious methodological weaknesses, were irreproducible, or provided inconsistent outcomes. None of the studies demonstrated sufficiently large correlations that would justify making astrological predictions on an individual basis. The objective of this dissertation is to provide a sensitive and replicable test of selected astrological hypotheses" (from abstract).

155 psychology students completed Form A of the 16PF questionnaire and provided their birth dates but not times. The aim of testing astrology was not disclosed. Average age was 20, and 73% were female. Multiple linear regressions between 21 astrological predictors (12 sun signs, angular differences between 9 planets and Sun) and each of the 16 PF scales gave 16 results, none with $p < 0.05$ (mean $p = 0.42$, mean $r = 0.09$). A regression between the weighted sum of 60, 90, 120 and 180 aspects (all 6° orbs) and the Relaxed-Tense scale was no better ($p = 0.83$, $r = 0.025$). In total 313 individual regressions were involved, less than the $4 + (16 \times 21) = 340$ theoretically possible because some regressions lacked sufficient data. When the best 17 regressions were extracted by stepwise analysis, more than half were individually significant, but not when corrected for $N=313$ tests. Of the top five regressions, the most complex regression was:

Subject's score on the 16 PF's Shy-Venturesome scale =

$$5.71 + 1.16AR - 0.97SG + 0.0053(SO-MO) - 1.50TA + 0.0411(SO-ME) - 1.65LE - 0.0088(SO-UR)$$

where 1 is entered for AR if it is the subject's sun sign (and the same for SG, TA, LE), otherwise 0, and the difference in zodiacal degrees is entered for SO-MO, SO-ME, and SO-UR. Multipliers have been rounded.

The observed r was 0.36, but to what extent was it inflated due to selection of factors after the event? To find out, the author applied the top five regressions to a new sample of 91 psychology students with 16 PF profiles. This time the observed r for Shy-Venturesome was -0.020 , so even the direction did not replicate. The mean r for all five regressions was 0.045. None of the results reached $p < 0.05$. But might the 16 PF be unsuitable for testing astrology? The author notes it is:

one of the more researched and popularly used psychological tests ... in all the [psychological] studies and reviews, the 16 PF consistently correlates with human behaviour enough to reach statistical significance ... and has demonstrated concurrent validity with a number of other psychological tests. Nevertheless, one may question whether the 16 PF and the astrological variables used here describe the same kinds of behavior. Both astrology and the 16 PF are presented as very broad-scope methods of behavior prediction, and on a theoretical basis should overlap (pp.25-26).

To test the overlap, he compared the descriptions of behaviour for each 16 PF scale with those for each sun sign given in the Parkers' 1975 book *The Compleat Astrologer*. Synonyms were not used:

Descriptions used by both Sun sign and 16PF scale		16PF scale
AR	Enthusiastic, Generous, Impatient, Impulsive, Lively	A, F, I, Q4
TA	Practical, Stubborn	E, M
GE	Intellectual, Lively, Restless, Spontaneous, Talkative	F, H, N, Q4
CN	Imaginative	M
LE	Enthusiastic, Generous	A, F
VI	Practical	M
LI	Easygoing	A
SC	Imaginative, Obstinate, Persevering, Stubborn, Suspicious	E, G, L, M, Q3
SG	Adaptable, Restless, Unconventional	A, L, M, Q4
CP	Persevering, Pessimistic, Prudent, Rigid	A, F, G
AQ	Independent, Stubborn, Unconventional	E, I, M, Q2
PI	Adaptable, Humble	A, E, L

There are 23 descriptions common to both sun signs and 16PF scales. So the poor follow-up results cannot be explained by a failure to use the same descriptions. The author concludes:

the validity of these astrological variables is seriously questioned by these results ... astrology is a widespread and lucrative enterprise. If astrological hypotheses cannot be supported by objective, impartial research, then one may question the degree to which astrological practice constitutes a useless, if not fraudulent, endeavour. Although many astrologers may have a sincere belief in astrology, serious consideration must be directed toward the possibility that astrologers advertise a product that cannot be realistically delivered and which would not be supported under reasonable criteria of accountability (pp.39-41).

Comment This study was conducted in the years preceding 1978 without the help of a computer. Since then better measures of personality and better tests have become available but with no difference in outcomes, for examples see *Personality tests* in subject index.

7.6.1978.2 Married vs randomly matched couples N=35

Frances Scully, *Planetary position and marital status*, Masters thesis, Department of Family and Community Development, University of Maryland 1978. The author is a family counsellor and family services professional.

Positive findings in the astrology of relationships would encourage expansion of existing models of family formation. But even in 1971 US psychologist Bernie Silverman (*Journal of Psychology* 77(2), 141-149, 1971:141) could comment that "the scientific community's neglect of astrology has allowed it to prosper by effectively rendering it immune to falsification". So is there an astrological difference between married couples and randomly matched couples?

To find out, 35 married couples who responded to a request for accurate birth data including time were rematched at random (via tables of random numbers) to form 35 unmarried pairs. Excluded were rematches and matches between known relatives or known business partners. Mean age was 30, range 23-55, mean marriage duration 11 years, range 1-26. Of the 70 birth times, 53 were from a birth certificate or hospital record, the rest were from a family record or recollection. All birth chart calculations were by Neil Michelsen's Astro Computing Services.

Interchart aspects were counted for each couple between Sun through Pluto, Ascendant and MC, a total of $12 \times 12 = 144$ different pairs, minus the $5 \times 5 = 25$ pairs between Jupiter through Pluto (removed to prevent artifacts due to the increased age difference likely in randomly matched couples), total 119 pairs. Here are the results. In each case N = 35 couples:

Aspect	0	60	90	120	150	180	Total
Orb in degrees	10	6	10	10	3	10	
Mean frequency in married couples	7.57	8.31	13.17	11.48	4.68	6.06	51.28
Standard deviation	2.86	3.44	4.51	4.02	2.91	2.76	
Mean frequency in random couples	7.17	8.23	12.74	13.31	3.51	6.57	51.45
Standard deviation	3.66	3.03	3.77	3.99	1.95	2.66	
Married minus random	+0.60	+0.80	+0.43	-1.83	+1.17	+0.41	-0.17
p of difference by t-test	0.61	0.92	0.67	0.060	0.052	0.43	

Two differences (for aspects of 120° and 150°) approach significance at the $p=0.05$ level, but both are opposite in direction to that traditionally expected, as is the result for 90° aspects. Aspects traditionally associated with attraction (Ascendant vs the partner's Ascendant, Sun,

Moon, and Venus) did not reach statistical significance. Nevertheless the author concludes that the null hypothesis of no significant difference cannot be decisively rejected.

Also counted was the placement of Sun through Pluto in the other's Koch houses, a total of $2 \times 10 = 20$ placements for each couple. Expected frequencies were calculated from the mean Koch house size in degrees for the 70 birth charts. The table below shows the percentage of all placements $\times 10$ occurring in each Koch house. Thus the first entry of 71 under house 1 means that 7.1% of all placements occurred in house 1. In each case $N = 35$:

Placements	House 1	2	3	4	5	6	7	8	9	10	11	12	Total
Married couples	71	81	81	71	69	63	90	120	114	96	61	81	998
Random couples	66	101	83	76	57	87	90	96	94	89	97	64	1000
Expected	82	86	92	81	77	80	82	86	92	81	77	80	996
Mean house size°	29.6	31.0	33.0	29.5	28.2	28.6	29.6	31.0	33.0	29.5	28.2	28.6	359.8

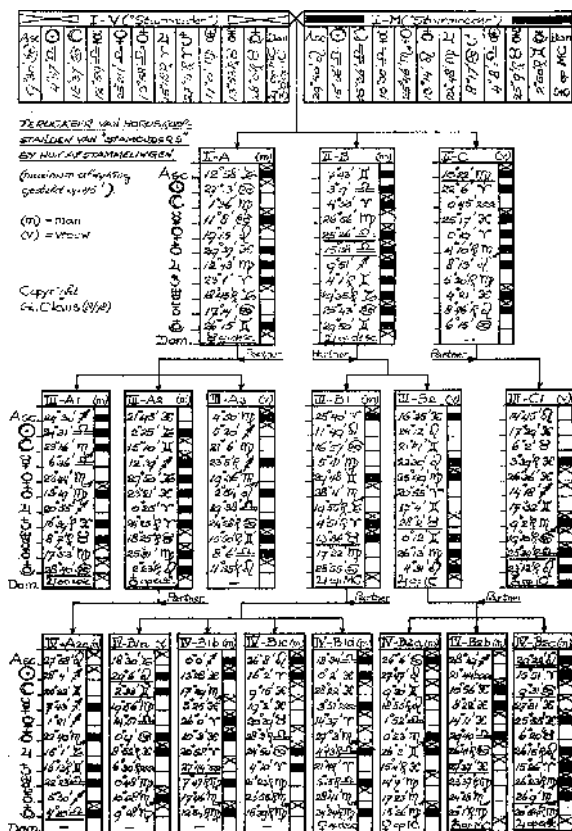
Differences

Married minus random	+5	-20	-2	-5	+12	-24	+0	+24	+20	+7	-36	+17	-2
Marr minus expected	-11	-5	-11	-10	-8	-17	+8	+34	+22	+15	-16	+1	+2
Rand minus expected	-16	+15	-9	-5	-20	+7	+8	+10	+2	+8	+20	-16	+4

None of the differences were significant and no pattern was discernible, although the emphasis on houses 7, 8, 9, and 12 was more distinct when the sample was limited to the 22 couples with birth times recorded to the minute in their birth certificate. **Comment** Compared with the expected frequency, the placements for both married and random couples tend to be lower in houses 1-6 (mean difference -7.5) and higher in houses 7-12 (mean difference $+8.0$), a difference (-7.5 vs $+8.0$) that by t -test is individually highly significant ($p=0.004$, $df=22$). Which suggests the presence of seasonal artifacts.

7.6.1978.3 Four generations of a family 1880-1973

George Claws, unpublished study, The Netherlands 1978. The author is a retired chemical engineer with an active interest in astrology since 1938. He sent in his study as a contribution to research after reading *Recent Advances*.



In the astrological literature you will find general, rarely documented, remarks implying that birth chart similarities exist between parents and their children. Thus the French astrologer Paul Choissard claimed that a child's ascendant and planets were more frequently conjunct, square or opposition those of their parents than those of unrelated persons (*La Loi d'Hérédité Astral* 1919). But I have been unable to confirm such systematic patterns. On the other hand, striking similarities do occasionally occur in family horoscopes, which led me to look in detail at four generations of a Dutch family for which complete and accurate birth data were available. The ancestral couple in my study (husband born 1880, his wife born 1885) had 3 children, 6 grandchildren, and (up to 1973) 8 great-grandchildren.

The author did his painstaking work in the days before computers. He was also in retirement without the help of his secretary and her typewriter, so his report was in his precise handwriting. Adjacent is his hand-drawn astro-genealogy tree from the two great-grandparents at the top, then their 3 children, 6 grandchildren and 6 great-grandchildren. Crossed or black squares identify links to the male or female ancestor respectively.

Here too were some striking similarities. For example one of the great-grandchildren had his Moon (9CN31) almost exactly on the ascendant (9CN30) of his great-grandfather, and his ascendant (29LE22) on the ascendant (29LE50) of his great-grandmother. It may seem difficult to brush this off as a coincidence, nevertheless a control study of 18 unrelated persons with accurate birth data and no links with the ancestral couple revealed similar striking similarities, which in this case were clearly not due to astro-genealogy. This approach may not always be valid (for example for slow moving planets) but it does give a feel for the situation.

With an orb of 45', the frequency of a match between the zodiacal positions of the ancestral ascendants and planets and those of later generations (albeit often in other signs and involving other planets) was 48% of the maximum possible frequency. This may seem promising, but the corresponding frequency for the control group was 42%, too close to allow a clear conclusion. Also counted were the number of multiple-of-30-degree aspects of orb 1° between the ascendant and planets that the ancestral couple had in common with their descendants. The male and female ancestors averaged 8.5 and 8.6 per descendant respectively, vs 8.8 and 6.7 for the control group, again too close to allow a clear conclusion.

The author concluded **(1)** there is no evidence that clear-cut astro-genealogical laws exist, **(2)** much can be attributed to chance, and **(3)** further research with "unimpeachable control groups" is required to reach a clear conclusion. **Comment** That was in 1978. Today such controls are readily realised by computer. But the implied involvement of sign positions when signs have been decisively disconfirmed suggests we can already guess the outcome.

7.6.1979.1 Social psychology of belief in astrology

Graham Tyson, PhD thesis *The Social Psychology of Belief in Astrology* University of the Witwatersrand 1979.

The author starts with a few preliminary tests of astrology's validity. The sun signs of 10,313 graduates did not significantly match their career categories. 615 student CPI profiles (57% males) did not significantly match their sun signs and failed to confirm Pellegrini's femininity finding (see 7.1.1976.1). Fifteen female students with time, date and place of birth were given five chart readings by a professional astrologer but neither they nor a close friend could significantly pick their own ($p = 0.23$). Ratings by the astrologer on the five personality scales of the South African Personality Questionnaire correlated -0.20 with the actual questionnaire scores, -0.23 with self-ratings, and -0.23 with close-friend ratings, all in the wrong direction. The questionnaire scores correlated 0.56 with self-ratings and 0.35 with close-friend ratings, confirming that the negative results were due to the astrology and not the questionnaire.

The author then had 350 female psychology students mean age 18.5 years complete the EPI, the Rotter Locus of Control, a questionnaire measuring interest in astrology and definite belief in astrology, and questions about their religious interests. Multiple regression analysis showed that the main determinants of belief were locus of control (more external = more belief) and religious importance (more Christian = less belief, but Jewish had no effect). To see if this also applied to people who visit astrologers, the author obtained responses from 67 clients of astrologers and 136 control subjects from areas unrelated to astrology. He concludes:

The overall picture which emerges from the results is that consultation of an astrologer is frequently a response to stresses with which the individual is faced. ... Furthermore, it appears that when stress is high, the effects of other factors such as religion and locus of control ... are diminished. In other words, under conditions of high stress the individual is prepared to use astrology even though under low stress conditions he believes it is nonsense (p.199).

But since there seems to be little truth in astrology, why are so many people convinced of its accuracy? The author suggests it is mainly due to *generality* (people can fit any reading to their self-perceptions) and *social desirability* (which is preferred to truthfulness). So it is:

highly probable that anyone who consults an astrologer is likely to come to believe in astrology. In fact, the person who does not react in this fashion is the exception and may well be a more interesting and informative subject of research than those who accept the horoscopes as being accurate (p.211).

7.6.1979.2 Testing the elements in astro-palmistry N=102



Geoffrey Dean and Ronald Hedgcock (pictured), The elements vs psychology, astrology and palmistry: An empirical classification Part 1 *Astrological Journal* 21(2), 75-82 and 110-111, 1979. Part 2 *Astrological Journal* 22(1), 27-34, 1980. Hedgcock was a practising palmist specialising in the study of hand classification systems. Because the four elements are fundamental to astrology and palmistry but have been much less tested than signs, this summary is longer than usual.

Heat and moisture vs E and N

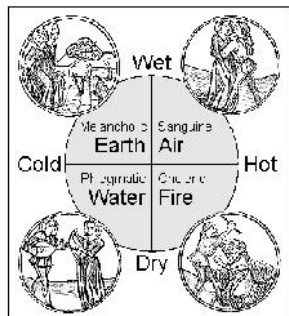
Up to Shakespeare's day, people believed that four distinct body fluids or humours caused four distinct human temperaments. A balanced person had humours in equal amounts, whereas a temperament was caused by a humour in excess:

Melancholic caused by **black bile** (congealed blood from the spleen).

Sanguine caused by **blood** (the circulation of the blood was then unknown).

Phlegmatic caused by **phlegm** (as in the throat).

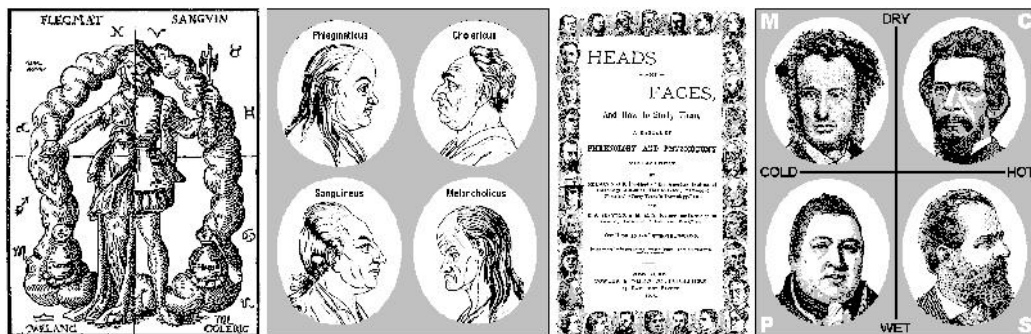
Choleric caused by **yellow bile** (from the liver and stored in the gall bladder).



The diagram shows how temperaments and elements (Fire, Earth, Air, Water) arose from the primary qualities (Hot, Cold, Wet, Dry).

In their day the temperaments were almost as popular with artists as zodiacal man. These 1498 woodcuts from *Deutsche Kalendar* show **cold wet Melancholic** as an old weary couple with the man resting his head on a table, **hot wet Sanguine** as an embracing couple, **cold dry Phlegmatic** as a retired couple enjoying leisure and music, and **hot dry Choleric** as a man furiously beating his helpless wife.

Later artists focused on clothing and especially on faces:



From left: (1) 1574 alchemical woodcut from Leipzig with a half-female and half-male figure with signs wrongly in natural order instead of in element order. (2) Faces in 1792 according to the Swiss physiognomist Johann Lavater (1741-1801). (3,4) Faces said to be typical of each humour from Sizer and Drayon's best-selling *Heads and Faces and How to Study Them: A Manual of Phrenology and Physiognomy for the People* 1893:19-20 (according to its title page it had sold 115,000 copies in thirty years). Ironically their faces bear little resemblance to Lavater's faces.

The nature of each temperament depends somewhat on the writer, but perhaps the most detailed descriptions are given by the German philosopher Immanuel Kant (1724-1804) in his *Anthropologie* published in 1798, which can be summarised as follows:

Choleric	Active, unreliable. Hot-headed. Easily upset. Self-centred.
Melancholic	Slow, reliable. Anxious, unsociable. Easily upset. Self-centred.
Sanguine	Active, unreliable. Easy going. Not easily upset. Very sociable.
Phlegmatic	Slow, reliable. Calm, controlled. Not easily upset. Acts on principle.

The above descriptions were modernised around 1890 by the famous German experimental psychologist Wilhelm Wundt (1832-1920). He postulated that the four temperaments were caused by the interaction of two independent dimensions of personality, namely (in today's terminology) direction and stability. Each dimension was a continuum between two extremes, namely active-passive and stable-unstable, similar to that between hot-cold and wet-dry. But at the time his postulated dimensions could not be objectively measured.

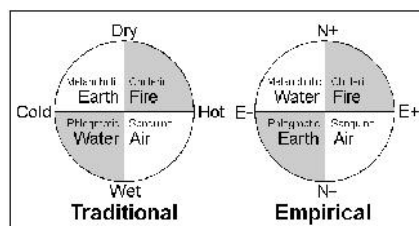
This gap was filled when HJ Eysenck (*The Structure of Human Personality* 1970:318-349) showed that the Kant/Wundt descriptions agreed with observed combinations of extraversion and neuroticism. Eysenck noted that this agreement is hardly surprising because it involves observable human behaviour, and there is no reason to suppose that ancient observations (at least at this level) were less astute or less accurate than modern ones.

This agreement can be extended to the elements as shown below:

This humour...	has these traits...	so it fits this EN combination	The traditional element is...	for which we find
Choleric	active, easily upset	E+N+	Fire	) The fit is
Sanguine	active, not easily upset	E+N-	Air	) excellent.
Melancholic	slow, easily upset	E-N+	Earth	) The fit is excellent
Phlegmatic	slow, not easily upset	E-N-	Water *	) only if interchanged.

* To see why Water was traditionally Phlegmatic, think of watery phlegm.

Earth and Water are the wrong way round in stability, and fit only if interchanged. So the meaning of Earth has to be based on *Earth = Phlegmatic*, where *phlegmatic* has its regular meaning of *evenness of temper* or E-N-. Similarly the meaning of Water has to be based on *Water = Melancholic*, where *melancholic* has its regular meaning of *gloomy and sad* or E-N+. [The mismatch between Earth and Melancholic was also noted by US astrologer Judith Hill in her *Astrology of Depression* (2016:4-6) and empirically by the Martindales in 7.2.1988.6].



Left: Traditional alignment of temperament, element, and primary quality as pictured above. Hot dry Choleric/Fire is diagonally opposite cold wet Phlegmatic/Water (think of watery phlegm).

Right: Empirical alignment according to the above best fit. Here E+N+ Choleric/Fire is diagonally opposite E-N- Phlegmatic/Earth. The traditional temperaments retain their position but the elements aligned with them have to be interchanged to make sense.

Is the above interchange a challenge to tradition? No, because it is entirely compatible with the extravert/introvert alternation of sign meanings starting with Aries, and the grouping of sign meanings by their emotionality as tested by Mayo, White and Eysenck in their study of sun sign self-attribution, see 8.3.7. In other words it merely corrects an alignment based on the wrong symbolism (a good example of how symbolism can mislead). To check this we can compare the above empirical meanings with the traditional meanings given by leading astrologers:

Fire	Earth	Air	Water	
Extravert	Introvert	Extravert	Introvert	) E Empirical meanings
Unstable	Stable	Stable	Unstable	) N from Eysenck 1970.
Active	Practical	Intellectual	Emotional	) Traditional meanings given by top
Enthusiastic	Cautious	Communicative	Intuitive	) astrologers Carter, deVore, George,
Impulsive	Stable	Lacks feeling	Unstable	) Hone, Mayo, Parker & Parker.

The match is good, except that Air (E+N-) is not necessarily intellectual and Water (E-N+) is not adequately described as emotional/intuitive. The empirical meanings can be obtained by combining the descriptions of E and N given by Eysenck and Wilson eds (*A Textbook of Human Psychology* 1978:135):

Extravert E+	Active, sociable, impulsive, casual, unreliable, demonstrative.
Introvert E-	Quiet, retiring, cautious, serious, reliable, reserved.
Stable N-	Calm, cheerful, stable, self-confident, independent, stress-resistant.
Unstable N+	Moody, worrying, unstable, lacks confidence, dependent, easily upset.

By definition there are equal numbers of people in each element. But from the known distribution of E and N, only about 5% of the population approach a pure element, about 75% are more or less neutral, and the remaining 20% are in between. This means that most people will readily accept any or all element interpretations as applying to them, just as they will accept any sign interpretation as applying to them at some time or another (see 8.3.2).

Eysenck and Wilson (1978:138) point out that certain elements tend to predominate in certain human conditions. Thus erratic drivers and criminals tend to be Fire (E+N+); sportsmen and commandoes tend to be Air (E+N-); scientists and successful businessmen tend to be Earth (E-N-); and neurotics and gifted artists tend to be Water (E-N+). These findings do not always support traditional element meanings; thus sportsmen are traditionally Fire, not Air.

Elements and hand classification

Hands are like faces: their variety is enormous. Hand classification tries to break this variety down into a small number of recognisable types. But hands can vary in very many ways, for example in size, texture, flexibility, colour, palm shape, finger shape, nail shape, fingerprint patterns, number and quality of lines. Each is largely independent of the others, so no simple system can cover all of them. Indeed, the great and devastating rule that palmists have to learn is that everything can modify everything else. Nevertheless it is instructive to see whether the element indicated by hands matches the element indicated by birth charts.

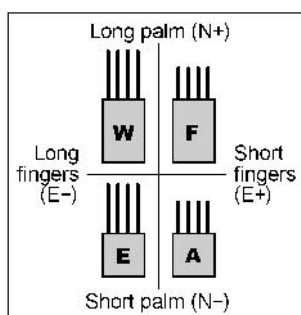
Numerous hand systems have been proposed since the 1850s, but none were widely used until the British palmist/astrologer/occult historian Fred Gettings proposed a simple method of dividing hands into four element types, which has become the most successful method of hand classification ever put forward. He published his system in various books including three coffee-table books with lavish full-colour illustrations (*The Book of the Hand* 1965, *The Hand and the Horoscope* 1973, *The Book of Palmistry* 1974). At the time, for such a specialised subject (his books are not for beginners), this was unprecedented.

From a comparative study of palmistry and astrology extending over 20 years, Gettings observed that the traditional element interpretations seemed to match certain hand forms that were well accepted by palmists. He was then able to devise a system of four hand types that corresponded to the elements, and therefore also to the birth chart, which of course has vital implications for astrology – if both hand and chart can be related to the elements, it could potentially demonstrate the validity of both astrology and palmistry in one hit.

Gettings's system is based on two independent variables, namely the length of the palm and the length of the fingers, whose meanings are those generally accepted by palmists:

Palm short = stable; long = unstable.

Fingers short = quick, impatient, lacks detail; long = slow, patient, detailed.



Although not recognised by Gettings, the accepted palm-length meanings (stable/unstable) align with N, and the accepted finger-length meanings (patient/impatient) align with E.

This diagram shows how their combinations match combinations of E and N. The indicated locations for Earth and Air match Gettings's *meanings* for Earth and Air, but not his *names*, which he interchanges to match tradition. Thus he uses Air as the name for his Earth meanings, and Earth as the name for his Air meanings. To make this diagram fit his *names* the labels E and A should be interchanged (it still doesn't fit astrological tradition, see previous figure). That Gettings can allocate Air people to Earth, and vice versa, is easily explained because his arguments are largely theoretical. He never refers to the actual character of his subjects.

To test Gettings's system we compared the hand dimensions of 106 adult volunteers with their E and N scores on the EPI as used by Mayo et al in their study of sun sign self-attribution, see 8.3.7. The volunteers were recruited via notices in Perth city bookshops. Four recorded a significant score on the EPI Lie scale and were excluded. The result was 51 females and 51 males. Average age in years in both groups was 32 sd 11, range 19-63 (females) and 18-71 (males). 65% were born in the southern hemisphere. We made the following measurements:

Finger length middle finger between its tip and the lowest crease at its base.

Palm length between the above lowest crease and the nearest crease at the wrist.

Hand width between edges at the lowest creases of index and little fingers, fingers held together.

We measured both hands and used the means. The measurement positions are arbitrary but conform to those commonly used by palmists. Their means and sds in mm were:

Hand dimensions	51 females		51 males		Same relative to hand width			
Finger length	76.6	4.1	83.9	5.1	1.02	0.07	1.00	0.06
Palm length	98.9	4.8	109.0	6.3	1.31	0.09	1.30	0.09
Hand width	75.4	4.5	84.2	4.7	1.00		1.00	

The female and male hands differ very significantly in size (all p 's are <0.00001 by t-test) but not in size relative to hand width ($p = 0.13$ finger and 0.58 palm). The correlations between the above means and EPI scores are shown below, with p values in () for the highest:

Correlation	51 females		51 males		Same relative to hand width			
E vs finger length	0.18		0.17		-.07		0.02	
palm length	-.09		0.19		-.26	(.08)	0.02	
hand width	0.24	(.10)	0.18					
N vs finger length	0.01		-.23	(.11)	0.08		-.35	(.02)
palm length	-.07		0.13		0.05		0.01	
hand width	-.09		0.11					
E score vs N score	-.15		0.11					

Long fingers (supposed to indicate E-) should correlate negatively with E, while long palms (supposed to indicate N+) should correlate positively with N. But in each case the mean of four correlations (respectively $+0.08$, $p = 0.59$, and $+0.03$, $p = 0.84$) is in the wrong or right direction respectively, and is far too weak to even marginally support Gettings's claims.

What about controls? Fortunately hand size does not change over the age ranges involved, so age and hand dimensions are uncorrelated, which makes them useful as controls:

Comparison	r for 51 females		r for 51 males	
(finger length	-.03	$p = 0.84$	0.14	$p = 0.34$
Age vs (palm length	-.30	$p = 0.04$	0.05	$p = 0.73$
(hand width	0.13	$p = 0.37$	0.30	$p = 0.04$

Two of the above results are individually significant ($p = 0.04$), but among three tests each this significance disappears ($p = 0.12$), so they show only how multiple testing can generate spurious significance from uncorrelated data. None of the actual results reach this level.

As expected there was generally a significant correlation between finger and palm lengths, ie long palms tend to have long fingers, but interestingly only for females ($r = 0.55$, $p < 0.0001$) not for males ($r = 0.08$, $p = 0.59$). This reflects the common palmistic experience that there is a typical female hand (long and slender) possessed by a majority of women, but not a typical male hand possessed by a majority of men. For women this negates a basic requirement of Gettings's system that finger length be independent of palm length.

Gettings says that other factors can affect the hand type, such as few or many lines, which if dominant can negate the finger/palm indication. Most palmists relate a palm with many lines to sensitivity and lack of stress resistance, ie to N+. But the mean E and N scores of subjects with few or many lines were not significantly different from the group means. See also below.

For a final test of Gettings's system we compared the empirical element of each subject with their hand element, using respectively their mean E and N scores and their mean dimensions to define the quadrant boundaries. We excluded 12 subjects who were too borderline for reliable allocation. To strengthen the allocation we excluded 50 subjects who were closer than 0.7 sd to any quadrant boundary; the results were better but not not usefully better:

Number of subjects	--Observed--		Hits expected by chance	Effect size $r \approx (\chi^2/N)$
	Hits	Misses		
90	20	70	22.5	-0.064
40	12	28	10.0	+0.115

When we applied Gettings's system to hands already classified by other systems, there was general agreement only on Water. Hands classified as Earth or Air are classified by Gettings as

Earth; Fire or Earth as Air; and Fire, Earth or Water as Fire. If nothing else this shows how easy it is to see in a hand or person (or chart) whatever one wants to see.

Birth chart vs Gettings hand type

Gettings claims that there is a clear link between birth and hand element, which *The Hand and the Horoscope* supports with 36 birth charts and hand print or photographs. He gives no rules for assessing the dominant element from the chart, variously using the sign position of planets, angles, stelliums, grand trines, and close trines. His 36 hand classifications are equally unsystematic – 14 agree with his rules, 13 do not, and 9 are not clear cut due to other factors. At no time does he refer to a subject's actual character, nor does he give birth data. Despite our best efforts we failed to find any chart factor involving signs or elements that consistently agreed with Gettings's hand type. A further 14 cases from our own files failed to find any consistent link with close major aspects or angular planets.

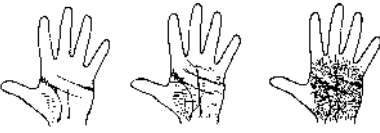
Conclusion: We found that Gettings's element system of hand classification, and his claimed link between chart element and hand element, did not perform usefully better than chance.

Comment A later unpublished study by us compared the EPI scores of 101 females (mostly from astrology conferences in the UK, Australia and New Zealand in the 1980s, mean age 35 years) with their line density self-rated via the diagram below:

For the following items please tick the relevant circle:

☐ Male
☐ Female

☐ Right handed
☐ Left handed
☐ Ambidextrous



Your hands have: ☐ Few lines ☐ In between ☐ Many lines

Females with feature

18 with few lines	Mean N	score	sd
68 in between	12.7	4.6	
15 with many lines	12.4	4.5	
Few vs many by t-test	13.7	3.6	

$p = 0.50$

The claimed link between line density and N+ was not confirmed, which does not deny that weak links may exist with actual line density (as opposed to self-rated line density).

However, a similar result was obtained by AJ Symaniz (*A study concerned with investigating the potential diagnostic value of palmar-analysis within the field of psychology, by comparing some general claims of traditional palmistry with empirical considerations*, honours psychology thesis, University of Adelaide SA 1980). The author trained ten non-palmist judges to rate line quality on 4-point scales for fine–coarse, few–many, broken–unbroken, and ordered–disordered. The ends of each scale were illustrated by example prints. For 20 hand prints the mean correlation between judges was 0.89, their mean test-retest correlation after 6 weeks was 0.87, and their mean test-retest correlation using photographs was 0.85, all excellent. For 51 mixed adults the correlations between their mean ratings and IPAT anxiety scores (similar to N scores) were:

fine +0.12 $p=0.40$, **many** -0.38 $p=0.006$, **broken** -0.32 $p=0.02$, **disordered** -0.23 $p=0.10$

So in this sample the anxious (N+) person tended to have lines that were significantly few and unbroken, both opposite to what most palmists would predict.

This outcome supports a general rule about the validity of factors in astrology, palmistry, and other practices that claim to know a person without making their acquaintance. Regardless of the agreement among practitioners on a factor's validity, it seems that hidden persuaders and other artifacts will most likely deny that it will work under controlled conditions, at least not to a useful extent. Examples are the factors tested in the present book.

An example not involving astrology or palmistry is Lester et al (*Perceptual and Motor Skills* 44, 137-138, 1977). They tested 111 mixed students and found the correlation between forward slant (the one graphological sign for extraversion mentioned by all graphology books) and E score was 0.08 ($p = 0.41$). The hit rate for a graphologist sent 38 handwriting samples from the top and bottom sixths in slope was 21 correct vs 19 expected by tossing a coin, binomial $p = 0.38$). The agreement between graphology authors meant very little. See also 9.9.7.1.

7.6.1979.3 Planetary strength, two astrologers, 31 subjects

Michael Startup, An empirical study of certain astrological tenets 1979. This study won second prize in the AA prize competition for 1979, a series begun in 1970 and awarded for the year's most valuable contribution to astrology. His study compared Jupiter cadent and Saturn cadent vs Jupiter angular and Saturn angular in 31 subjects who had one or other of these placements, for 7 personality dimensions including E and P. Two tests reached significance, but not when corrected for number of tests. More interesting is his test of astrologer agreement, summarised below.

Each of two astrologers had to rank order the relative strength of Jupiter in the charts of the above 31 subjects (mean age 26 years), no two charts could have the same strength. And the same for Saturn. Astrologer A judged relative strength by the number and closeness of aspects to SO, MO, Asc, and MC. Astrologer B judged "immediate strength" by sign, house, angularity, and their SO and MO aspects, and "overall strength" by the whole chart including rulerships, dignity and midpoints. The correlations between their judgements were:

Astrologer A strength of		JU				SA		
Astrologer B	immediate	JU	0.20	$p = 0.30$	N=31	SA	0.19	$p = 0.61$ N=31
	overall	JU	0.19	0.33		SA	0.001	-

indicating essentially no useful agreement. Nor did any of the strengths correlate usefully with the ordered extraversion scores (**A** 0.03/0.16 for JU/SA; **B** -0.17/-0.14 for JU, 0.22/0.26 for SA, of which all but the first are in the wrong direction). The author concludes that:

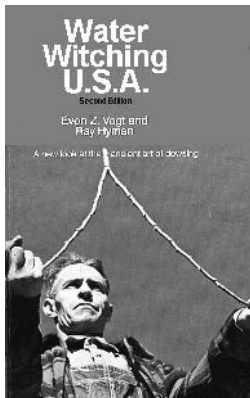
the lack of agreement between these two qualified and experienced astrologers is not encouraging. This result gives us no reason to believe that astrologers have yet worked out a reliable method for determining the relative strengths of planets in a horoscope (p.68b).

He notes that there are two major methods of assessing planetary strength, namely Volguine's method involving mainly rulerships and exaltations (*The Ruler of the Nativity* 1973), and The Church of Light's astrodynes (*30 Years Research* 1956) involving mainly aspects, parallels and angularity. Both claim an impressive empirical basis (respectively 40 and 30 years of research on many hundreds of charts), yet each involves criteria specifically rejected by the other, and each gives different results for the same charts. Which is further support for his conclusion.

Comment The poor agreement between astrologers generally was later confirmed by Timm and Köberl (*Zeitschrift für Parapsychologie und Grenzgebiete der Psychologie* 28, 33-55, 1986), who re-analysed an unpublished validation study of 178 German astrologers originally made in 1952-1955 by Hans Bender's Institute for Borderline Areas in Psychology, the largest single sample of astrologers ever tested. Despite the traditional German concern for precision, the mean agreement was only 0.10 for an average of 80 astrologers matching a total of over 50 charts. Similarly the mean agreement for 35 studies of agreement was 0.10, see 8.6.12.

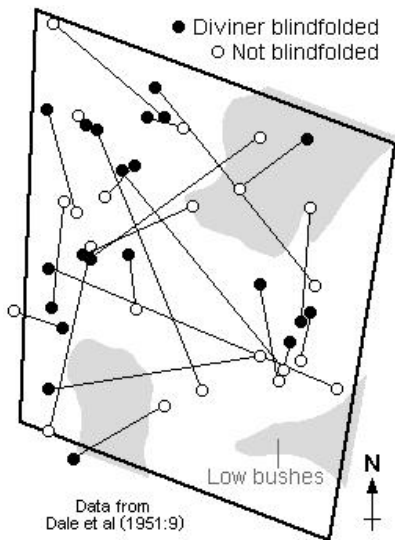
7.6.1979.4 Water divining and the grand delusion of experience

Evon Z Vogt and Ray Hyman. *Water Witching USA: A new look at the ancient art of dowsing* Second edition 1979. How personal experience without due scientific caution leads diviners to wrong conclusions that they refuse to accept as wrong – just as astrologers do in astrology. This summary includes one of many later confirmatory Australian tests.

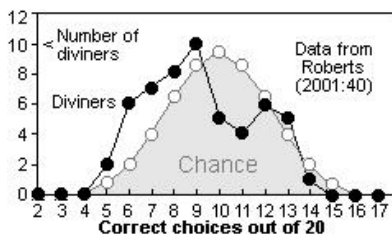


There is no doubt that water diviners do successfully find water. But success could be due to factors other than divination. Diviners may unconsciously follow cues from vegetation, topography, and soil type. Underground water may be so extensive they cannot fail. They may remember hits and forget misses. Such artifacts have to be excluded before anyone can decide if divining works for the claimed reasons.

US diviners in 1979 were about 1 in 7100 of the population. Controlled tests have failed to support dowsing claims. Thus diviners cannot locate buried pipes containing flowing water, or tell whether water is flowing in buried pipes of known location, or find the same location in the field when blindfolded. Afterwards they *always* find excuses despite being more successful when controls are removed:



In 1949 the Dale et al blindfold test (*Journal of the American Society for Psychological Research* 45, 3-16, 1951) took place in a dry field in Maine where visual cues to the presence of water were absent, where the water table was stable and present at depths not over 5m, and where the ground was soft enough for test pipes to be driven down without drilling. The field was level enough to walk on when blindfolded. In places low bushes upset free movement but not seriously. A total of 27 water diviners recruited by ads in newspapers were blindfolded and then led to the test site where each had to (1) divine the best place to sink a well and (2) estimate the depth and how fast water would flow in when pumped out. Each diviner then went through the same procedure but without a blindfold. About nine diviners were tested per day. Two controls (a geologist and a water engineer) each estimated the depth and flow at 16 points located evenly over the field based on what they knew about underground water in general. At each point, and at each site selected by a diviner, a pipe was driven into the ground until it touched water. A pump then removed water to measure how fast water flowed in. Both controls accurately estimated depth, which ranged from 1 to 3 m, and the water engineer fairly accurately estimated flow, which ranged from 2 to 20 litres per minute. But each diviner's estimates of depth and flow were wildly high and even the best showed no relation with reality. Worse, as shown in the diagram, the diviners did not agree with each other or with themselves when blindfolded.



This test of 52 diviners used 20 two-litre plastic bottles containing either water or sand, in opaque paper bags laid out 1 m apart in a long curve on a bowling green. All diviners confirmed their abilities on containers with visible contents, and all were confident of success. But the results were slightly worse than chance. The most successful diviner (14 hits) had never divined before. Afterwards 7 diviners complained about underground streams but in different places. Others said the sand was damp (it wasn't). One excuse was: "If I hadn't changed my mind I would have been right". From S Roberts, *the Skeptic* [Australia] 21(4), 40-43, 2001.

Vogt and Hyman survey the consistent failures of such tests in various countries and conclude:

The most disturbing reaction ... goes something like this. By currently accepted scientific standards dowsing cannot be demonstrated. But, since dowsing is valid (according to the proponent), there must be something wrong with scientific method as applied to dowsing. Therefore, scientists should bend the rules or change the standards in order to allow dowsing to pass muster. Such a plea (or demand) for special dispensation misses the whole point of what science is about, [which is] to correct for the fallibility of our unaided intuitions and personal convictions (p.23).

Comment The prevalence of diviners (1 in 7100) is similar to the prevalence of astrologers (1 in 10,000), and their reaction to failure under controlled conditions is exactly the same as that of astrologers – the system works for me, therefore it has to be valid, therefore contrary evidence has to be wrong. Both are victims of the grand delusion of experience.

7.6.1980.1 Aspects in 213 divorced couples

Henk Verhoef assisted by NVWOA members, *Tijdschrift Astrologie* 4(1), 11-19, 1980.

NVWOA board members provided birth data for 213 divorced couples born 1895-1945. Their divorces occurred mostly in 1960-1964 under the old divorce laws, which made a divorce harder to obtain than under the new divorce laws, so in principle the harder divorce should show more easily in charts. The average marriage duration was 11 years, range 3 months to 47 years. The average age at marriage was 28 (men) and 25 (women). A control sample of 72 married couples came from a health file (marriage date was not available for these controls). For all couples the birth times (taken as noon) and places were unknown, so house positions could not be calculated, nor could exact Moon positions, but the study was still thought to be worth doing. Five major aspects (0, 60, 90, 120, 180) using orbs of 6° were counted between SO, MO, VE, MA on the one hand and JU, SA, UR, NE, PL on the other, giving a total of 4 x 5 = 20 planetary pairs and a total of 5 aspects x 20 pairs = 80 different aspect combinations. (Because 60, 90, 120 aspects are repeated at 300, 270, 240 the counts for 0, 180 were doubled to make them comparable.) The resulting counts for each sample were as follows:

Number of couples	213 divorced	72 married
Average aspects per chart	9.8	9.0

Some results were consistent with tradition, for example compared with the above average count per aspect, SO-0-UR and MA-0-NE were notably higher for divorced couples and lower for married controls. But other results contradicted tradition, thus VE-180-SA and VE-120-NE were notably lower for divorced couples and higher for married controls. Some aspects such as those between SO and PL were high in both groups. Others such as MA-180-SA and MA-120-NE were low in both groups. Some between-couple aspects such as SO-0-NE and MO-90-SA and those between SO and JU were high in both groups. Others such as VE-60-SA and those between MA and UR were low in both groups. The results show it would be dangerous to assess a relationship from the chart of only one partner.

Comment Without dividing samples in half (not done here) we cannot tell if the results are replicable. In other words we cannot tell if the results are due to astrology or to chance.

7.6.1980.2 Inventories filled in via birth charts for 60 subjects

Ulrike Kranz, *Validierung und objektivierung der von astrologen vorgenommenen persönlichkeits- und interessenurteilungen an zwei standardisierten testverfahren* [Validity and reliability of astrologers' judgements of personality and interests] PhD thesis, faculty of natural sciences, Karl Franzens University, Graz June 1980.

30 male and 30 female subjects mean age 37 range 25-57 completed the Freiburg Personality Inventory, the Personality and Interests Test, and questions about having a birth certificate (60% said yes), believing in astrology (35% yes), knowing their sun sign meaning (60% yes), having ever had their birth chart read (8% yes), and remembering what it said (3% yes).

The tests were chosen because they were known to be reliable (test-retest $r > 0.66$ depending on the scale) and measured things said to be discernible in birth charts. The FPI's 11 personality scales were: nervousness, aggression, depression, excitability, sociability, calmness, dominance, inhibition, openness, extraversion, emotionality, and masculinity. The PIT's 5 personality scales not covered by the FPI were: rural, social, control, fantasy, and suspicion. Its 8 interest scales were: manual-mechanical, science, administration, commerce, art, literature, music, and social work.

Six eminent astrologers including the president of the Austrian Astrological Society completed the same FPI and PIT as the subjects using each subject's birth chart to decide the answer to each question. The meaning of each scale was carefully explained in writing. Each astrologer had 10 male and 10 female subjects, of which half were shared with another astrologer to allow their agreement to be determined. Birth times were equally divided between those reported in full hours, those reported to 15-30-45 minutes, and those reported more precisely.

Results for personality The mean correlation r between subject and astrologer responses, and the mean agreement r between astrologers, was as follows. N = number of scales:

	Response r	sd	N	Agreement r	sd	N
Mean correlation *	0.044	0.080	32	0.087	0.121	16
Charts x astrologers	120			60		

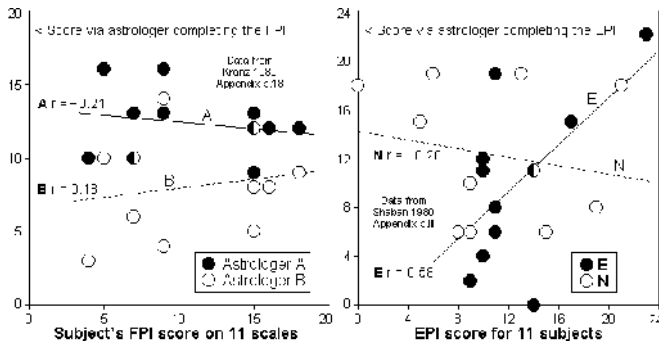
* Mean of correlations for raw scores and scores standardised to remove skew

No scale showed appreciably better correlations or agreement than others.

Results for interests The author does not report individual correlations, only the numbers that exceed the $p=0.05$ and $p=0.01$ levels. The corresponding numbers for personality scales were not appreciably different, so the mean correlations for interests are probably similar. The variations due to the subjects' age, gender, belief in astrology, and knowledge of sun sign suggested that the above slightly positive means were due to self-attribution. The author concluded that his eminent astrologers were unable to perform usefully better than chance, and that despite their eminence they were unable to usefully agree on what the charts showed.

Comment Similar results were obtained in a small study by Nabil Shaban (*The natal chart as a third party means of personality measurement*, BSc dissertation Surrey University 1979). He had an experienced astrologer complete the EPI form A and 16PF personality inventories for

11 subjects (10 female) mean age 29, range 20-41, all with timed births. The correlations between the subjects' actual scores and the astrologer-generated scores were E 0.58, N -0.20, E-via-16PF 0.08, N-via-16PF 0.44, of which only the first was marginally significant $p = 0.10$, which is clearly nonsignificant when corrected for the number of tests.



Left: Kranz's only detailed example of two astrologers independently completing the EPI for a subject aged 33 using her birth chart. The scores showed no useful correlation with the subject's actual scores (horizontal axis).

Right: Shaban had an astrologer complete the EPI for eleven subjects using their birth charts. If the resulting scores were in perfect agreement with their actual EPI scores (horizontal axis) each would lie on the diagonal running from 0 bottom left to 24 top right. But as in Kranz's case they are all over the place. A planned 2nd astrologer failed to respond.

7.6.1980.3 Mercury, Mars/Pluto and mediums N=59

Arthur Oram. Mercury, Mars and Pluto in the charts of mediums. *Astrological Journal* 22(4), 181-186, 1980. With many interchanges and personal communications over five months in 1981. A year later Oram withdrew his results on the grounds that they were a statistical artifact (*Astrological Journal* 23(4), 239, 1981), a point explained below.

Mediumship, the ability to receive communications from the spirit world, is held to be a rare and distinctive gift, so if astrology applies to mediums their charts should be equally rare and distinctive. To find out, Oram computer analysed the positions of 13 bodies (ten planets, Ascendant, MC, and Moon's node) in the timed birth charts of 59 mediums whose birth data had been carefully collected and verified by Pam Tyler. It was an especially reliable sample.

Early work using the usual aspects and harmonics produced nothing useful. Oram then found that 18 of the 59 charts had aspects of orb 1° between Mercury and the Mars/Pluto midpoint. Their number was much higher than expected (about 6), so he focused on this result, even though most of his sample (41/59) did not have it.

Eight different aspects had been found (0, 36, 45, 60, 72, 90, 108, 120, but not 30, 135, 144, 180) which with 1° orbs took up exactly 30° of 360° ($1 \times 2^\circ + 7 \times 2 \times 2^\circ$). The expectancy of getting the aspects actually found was nominally $30^\circ/360^\circ = 0.08333$. But to be sure, Oram counted the angular separation between Mercury and Mars/Pluto for 1890-1999 at intervals of 65 and 213 days (213d is 7 months) ($N=369$) and found 296 with separations $\leq 121^\circ$ (the maximum span of his aspects up to 120), notably more than the nominal expectancy of $369 \times 121/180 = 248.05$. So he increased the expectancy to $0.08333 \times 296/248.05 = 0.09944$, giving binomial $p = 0.00001$ for getting at least 18 such aspects in 59 charts. He concluded that ME=MA/PL was a highly significant factor in the charts of his 59 mediums. He found it surprising that some aspects were not involved, but even so: the results obtained are so outstanding and appear not to have been anticipated in the general approach by practising astrologers or in the literature (p.181).



Comment He was referring to Ebertin's *The Combination of Stellar Influences* 1970, which relates mediumship to the midpoints of Neptune and Sun, Moon, Uranus, Pluto and Ascendant, but not to the midpoint of Mars and Pluto (force, brutality), ME=MA/PL being related to nervous overworking and irritation. Some mediums have indeed been nervously unstable but many others have been well balanced, so yes, his result was not anticipated.

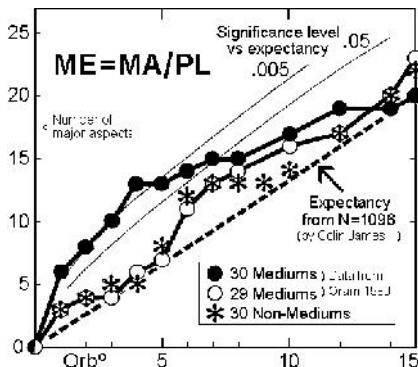
Nor was it anticipated by the meanings given by Michael Munkasey's *Midpoints: Unleashing the power of the planets* 1991, which relates ME=MA/PL to abusive language and descriptions of carnage or battle. Mediumship receives no specific mention in its page-long lists of concepts related to midpoints of Neptune and Sun, Moon (drugs, fantasy, illusion), and Uranus, Pluto

and Ascendant (deceit, deception, dreams).

But Oram's conclusion is invalid because the midpoints/aspects/orb were chosen by selection from the results. For his 13 bodies there are $13C2 = 78$ midpoints for each of his $1+7 \times 2 = 15$ aspects, making a total of $78 \times 15 = 1170$ possible midpoint contacts. If we pick the most promising midpoint by inspection, its significance will be inflated, as when we pick a playing card from a full pack and claim $p=1/52$. Also, because the orb is arbitrary, we have no reason to choose one rather than another, which can only add to the confusion.

More to the point, if the expectancy of chart factor X for mediums is 0.09944, then 0.09944 or nearly 10% of the population should be mediums. But clearly they are not. We could of course argue (as many astrologers do argue) that the link is not with mediums but with potential mediums, whatever that means, as in Dennis Elwell's memorable "picture on the seed packet". Except we would then have to replace our sample of mediums with one of potential mediums, which has obvious practical difficulties (arguably everyone is a potential medium).

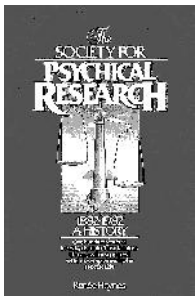
Nevertheless suppose we accept X as a valid indicator of mediumship. Suppose further that our first clients are Oram's original 59 mediums divided into two groups of 30 and 29, plus 30 non-mediums (people known to have no experiences that could possibly relate to mediumship such as psychic flashes, hunches, or vivid dreams). How good would our diagnosis be?



This was tested using a control group of 1096 charts kindly computer-generated by Colin James III at 20-day intervals over the same period 1888-1947 as for Oram's mediums. When the number of ME=MA/PL aspects was plotted vs orb, the significance of the 30 mediums is not replicated by the 29 mediums, and there is more similarity between the 29 mediums and 30 non-mediums than between the 29 mediums and 30 mediums. The significance of the two combined mediumship groups (which Oram based his conclusion on) is clearly largely due to the significance of 30 mediums, which when corrected for the number of midpoints from which the actual midpoint was chosen becomes close to chance, which of course explains why it does not replicate. All of which illustrates the perils of putting all our eggs in one basket. The moral is obvious – no matter how impressive the statistics, without replication no astrological result can be considered trustworthy.

In other words we could do just as well by ignoring charts and merely guessing, clearly not the kind of thing to make a happy medium. Unless astrology can bring some clear advantage, like superior reliability, it will not be in the race. But back to the prevalence of mediums:

We start with séances, the traditional gatherings at which mediums attempt to contact the dead. Many examples exist in antiquity, eg Saul's consultation with the Witch of Endor, but the term is generally used only in connection with modern spiritualism which began in the US in 1848 with the Fox sisters' table rappings (shown to be a hoax decades later by the sisters themselves). But related séance-activities from table-turning to ouija boards became popular, first in the US and later in Britain and Europe. Without modern distractions like the cinema, television, and a compulsive consumerism, people had more time for that sort of thing.



Oram was a member of the UK Society for Psychical Research, hence his interest in mediums. Its *History* confirms that professional mediums (as opposed to fortune tellers and oracles who have flourished in most times and places) originated with the Fox sisters and the advent of spiritualism in 19th century America. But because mediums were paid they had to deliver the goods, so they often resorted to trickery. Ronald Edwin in his 1955 book *Clock Without Hands* tells how he was persuaded to become a professional medium, but in due course had to abandon it to escape the web of deception that entangled him. SPR members had carried out many studies of mediums (too many for the *History* to describe all of them, some studies remain unpublished or confidential), and it singles out only five (Piper, Leonard, Walker, Garrett, Cummins) of which two were Irish, one was American, and two were English. These studies of mediums had yielded much of interest but nothing of value, so the empirical focus today is on mass experiments evaluated by statistical techniques. The Fox sisters eventually admitted they relied on trickery.

In those days in England the number of known good mediums was no more than a dozen in a population of about 40 million, a proportion of less than one in a million. If the standard of

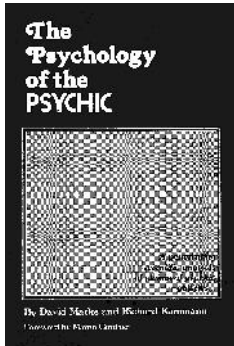
mediumship is reduced from good to mediocre, the proportion might be around one in ten thousand (0.01%), which in Western society is roughly the same as the proportion of astrology students and one-tenth the proportion of doctors. Be aware that if our factor X for mediums suggests that about 10% of the population are mediums when the actual proportion is around 0.01%, we will most likely be right only once in a thousand readings.

Of course if mediumship were fairly general, but most people failed to recognise it or chose to suppress it, we would need to change our approach from speculating to testing. We should take a hundred adults at random from the population, train them in mediumship, and test them. If all showed strong gifts it would imply that no chart factor could indicate mediumship (or at least tell who were mediums and who were not). But then charts would not be needed in the first place. More likely not all of our adults would show strong gifts, in which case it would be astrological business as usual (and back to the drawing board).

So we need to change our proposed factor X to factor Y whose prevalence is consistent with that of mediums. We cannot reduce expectancy by simply reducing orbs because this would merely increase misses. We could of course adjust the orb to maximise hits and minimise misses compared with a control group, but this does not necessarily address the problem. So we have no choice but to use a combination of chart factors, which immediately brings the disadvantage that the number of possible choices becomes indefinitely large, in the same way that a restaurant menu not limited to glasses of water is indefinitely long. But see 7.6.1982.4.

7.6.1980.4 Some Barnum experiments

David Marks and Richard Kammann. *The Psychology of the Psychic*, Prometheus, Buffalo NY 1980. Much is devoted to an exposé of eg Uri Geller and Nostradamus, but with much eye-opening research, of which this is an example. The original Barnum statements referred to by the authors are listed at the end of this summary.



In 1974 the authors tested the original Barnum statements on 66 New Zealand students. Each student was given the *same* set of statements as the supposed results of a personality test and had to rate it for accuracy. Contrary to what one might expect, 89% rated it *good* or *excellent*. Only 9% rated it *fair*, even fewer (3%) rated it *poor*, and none rated it *wrong*.

Oh, those New Zealand students, you say, a very gullible lot. Good thinking. You get A for prejudice. This result has been found repeatedly by psychologists all over America for the past thirty years (p.188). Or you might imagine that the result is produced by females (A for male chauvinism). There is no difference between men and women on this (p.188).

The Barnum effect is fundamentally important because it applies to:

the personality descriptions that are thrust on people by psychologists, psychoanalysts, psychiatrists, doctors, lawyers, social workers, bureaucrats, teachers, and families. (Let's see, is there anybody we missed?) It spares no one who offers diagnoses about other people and their problems and who takes acquiescence [ie acceptance] by the victims as evidence that the diagnostician knows what he is talking about. ... It doesn't matter very much what ritual is used to make a diagnosis. One can be just as convincing by asking for *birthdays* (especially to the hour and minute), for a sample of *handwriting*, for a *dream*, or for answer to a *personality test*. The test does not have to be the least bit reasonable [as when] the victim is asked to say true or false to items like "I think beavers work too hard", and "I am never startled by a fish" (p.191, their emphasis).

The authors then tried variations of their own. A description in which every sentence was the opposite of the original Barnum merely reduced the average rating from *good+* to *fair+*. Making every statement definite ("last year you were critical of your ability at sports" instead of "you have a tendency to be critical of yourself") produced the same average of *fair+*. A description that used items rated by a majority of 360 students as wrong ("your boundless energy is a little wearisome to your friends") still averaged *fair-* for 52 students, but even then two rated it *excellent* and nine rated it *good*. What is going on? What actually matters?

To find out, other students were given descriptions that were an equal mixture of original Barnum statements and the above wrong statements. Half the students had all the Barnum

items circled, the other half had all the wrong items circled, supposedly as test results (the students had to indicate which items should have been circled as correct). The results were striking. Those with Barnum items circled felt that 5% of the wrong items applied to them, whereas those with wrong items circled felt that 50% of them applied. In other words whatever was said to be true tended to be seen as true. So what actually matters is that some person acts as an authority and declares the statements to be true. The authors conclude that:

The point is this. The validity of fortune telling, horoscopes, biorhythms, palm reading, psychological tests, and other diagnoses is in no way supported by the fact that people feel the readings are true (p.193).

But what if the reading is vague and rambling. How is it possible to understand it let alone rate it for accuracy? Here another element of subjective validation comes into play – once one or two cues seem to fit, then suddenly the rest falls into place, and it seems impossible that the whole reading does not fit. If it seems preposterous that one or two bits of information (the cues) could organise a whole reading, consider the following piece of symbolic writing from Dooling and Lachman, *Journal of Experimental Psychology* 88, 216-222, 1971:

With hocked gems financing him / Our hero bravely defied all scornful laughter
That tried to prevent his scheme / Your eyes deceive he said
An egg not a table correctly typifies / This unexplored domain.
Now three sturdy sisters sought proof / Forging along sometimes through calm vastness
Yet more often over turbulent peaks and valleys / Days became weeks
As many doubters spread fearful rumors / About the edge
At last from nowhere winged creatures appeared / Signifying momentous success.

If you were unable to make sense of it, read it again but this time ignore the phrase given at bottom of the next page. It will be impossible to do so, either now or at any time in the future. So think before you peek. One simple cue has organised the whole piece forever (p.178).

Comment As in a chart reading. All of this is precisely the opposite of received wisdom and makes it unlikely that anything your astrologer says about you will be rated 100.0% wrong.

The original Barnum statements

The original ten Barnum statements were created in 1949 by US psychologist Bertram Forer to demonstrate how personal validation (ie the subjective assessment of personality statements such as those made in an astrology or any personality etc reading) seemed to be meaningful to the participants but was actually meaningless (The fallacy of personal validation: a classroom demonstration of gullibility, *Journal of Abnormal and Social Psychology* 44, 118-123, 1949). Ironically the source of the statements was an (unidentified) newsstand astrology book – and indeed as you read them note their similarity to a typical chart interpretation:

You have a need for other people to like and admire you, and yet you tend to be critical of yourself.
While you have some personality weaknesses you are generally able to compensate for them.
You have considerable unused capacity that you have not turned to your advantage.
Disciplined and self-controlled on the outside, you tend to be worrisome and insecure on the inside.
At times, you have serious doubts as to whether you have made the right decision or done the right thing.
You prefer a certain amount of change and variety and become dissatisfied when hemmed in by restrictions and limitations.
You also pride yourself as an independent thinker and do not accept others' statements without satisfactory proof.
But you have found it unwise to be too frank in revealing yourself to others.
At times you are extroverted*, affable, and sociable, while at other times you are introverted, wary, and reserved.
Some of your aspirations tend to be rather unrealistic. [*American spelling of extraverted.]

Marks and Kamman note how the statements contains opposites (p.190):

You have personality weaknesses.
You compensate for them (ie you have strengths)

You are disciplined and self-controlled.
You prefer change and variety, not restrictions and limitations.

You need other people to like you.
You do not accept others' statements without satisfactory proof.

You are extroverted, affable, sociable.

You are introverted, wary, reserved.

They explain how the opposites help the statements fit any situation. The key point is that the client sees the statements as being personally valid without realising they apply to most people. All spread throughout a reading that tells people who they are:

In each of these cases, a person is told (ambiguously) what kind of a day to expect, what kind of person he is, or what the future will bring. But life itself is a fluctuating stream of diverse moments, and there is a good chance we can remember, or shall come upon, events that agree with the diagnosis. And, like students who get the Forer effect, we end up saying, but it was so specific, it was right on the nose! Meanwhile, the evidence against the validity of these occult prophecies keeps accumulating (p.191).

Comment Whenever clients see the statements as being personally valid they don't just fool themselves, they give personality readers a dangerously false confidence in their powers of diagnosis. Of course this is a general problem not just an occult one, but in orthodox work it is overcome by using tests whose scores reliably compare clients with the general population. So clients can immediately see how they stand with respect to others (which is something that astrology is not yet able to do), thus eliminating the need for unsecured free-floating Barnum statements. See 9.9.6.1 for examples of Barnum statements in action in astrology.

7.6.1981.1 Is Venus related to relationship trauma?

Colin James III and Geoffrey Dean, unpublished study May 1981. James (in Colorado) was one of the first to own an advanced home computer and had developed one of the first computerised chart calculation and analysis programs. Dean (in Australia) had collected via clients, friends and associates several hundred responses to a 50-item questionnaire on a diversity of personal traits, circumstances and birth details. This joint pilot study was the result.

Hypothesis: the charts of people experiencing trauma in their relationships will show major progressed aspects (ie 0, 60, 90, 120, 180, 240, 270, 300, 360) to or by Venus. Method: the numbers of such aspects with orbs of 1° or 3° were counted for 21 people who had reported their relationships in 1979 were traumatic, and for 21 people who had reported their relationships in 1979 were uneventful. The subjects were born in New Zealand, Australia, or the UK, two-thirds were female, mean age in 1979 was 33 years standard deviation 6 years, and all births were timed. Transits were not tested. The results were:

No of prog major asp of orb 1° or 3° for relationships in 1979 that were											
Prog Natal		Traumatic		Uneventful		Prog Natal		Traumatic		Uneventful	
VE	MA	1	1	1	5	MA	VE	0	0	2	5
VE	JU	0	1	1	3	JU	VE	3	3	1	2
VE	SA	1	3	1	2	SA	VE	0	2	0	2
VE	UR	0	3	2	4	UR	VE	2	4	1	4
VE	NE	0	1	1	2	NE	VE	3	4	1	2
VE	PL	0	4	0	3	PL	VE	2	3	2	3
Total for 1°		2	13	6	19	Total for 3°		10	16	7	18
T > U?		No	No			T > U?		Yes	No		

Conclusion: the hypothesis was not supported, or at least not supported to an extent that would justify the effort needed for a large-scale study. In the parent population the proportion of people who reported their relationships in 1979 were traumatic was around 30%, or slightly more than the 20% who reported their lives generally were traumatic. N scores >14 and P scores >6 were reasonably indicative of trauma, especially if they occurred together, but there was no appreciable link with E scores.

Comment Various questions could be raised such as what happens if only hard aspects are counted, or subjects are divided by age or gender. But the sample is too small for this. The difference traumatic vs uneventful is presumably more than trivial for the victims, so if there was anything there it should have shone through regardless. A pity transits were not tested.

The phrase referred to on the previous page is "the voyage of Christopher Columbus".

7.6.1981.2 Extraversion: 5 inventories vs 3 astrologers

VM Gaynor, PhD thesis, Union for Experimenting Colleges and Universities, Ohio 1981. The work summarised below is part of a wide-ranging thesis that surveys the history of psychology and astrology and their interconnections.

The author's literature survey documents what she calls a "formidable research activity of the past 25–30 years" into astrological claims (p.viii). But the results have been mixed:

We have seen that the research of the last ten years has not yet unequivocally validated traditional astrological theory from an empirical point of view. ... Some researchers found correspondence and others did not. ... even those researchers demonstrating positive, statistically significant results have different astrological postulates [ie different astrological claims] as a basis (pp.174-175).

So she presents an exploratory test of links with extraversion, chosen because it is:

still among the most widely used personality variables in the prediction of behaviour. Several personality inventories have been constructed that either specifically measure this dimension, or contain a scale that measures it. Astrology does not postulate an introversion-extraversion construct per se. However, given the operational definition of these two attitudes, introversion can be said to correlate with the astrological earth/water polarity, and extraversion with the fire/air polarity [and hence with the corresponding signs and planets] (pp.179-180).

54 subjects mean age 38, range 19–68, completed five personality inventories for measuring extraversion (Minnesota Multiphasic Inventory, 16 Personality Factor Questionnaire, Myers-Briggs Type Inventory, Eysenck Personality Inventory, Gray-Wheelwrights Jungian Type Survey) and a 3-point self-rating scale (introvert, ambivert, extravert). 34 subjects lived in Washington DC (14 were students), the remaining 20 lived in Los Angeles. All had recorded birth times. Their computer-calculated birth charts were given to three experienced professional astrologers. Astrologer 1 (female) had a Masters degree in clinical psychology and had written a book on astrology. She gave priority to planets and aspects. Astrologer 2 (male) also had a Masters degree in clinical psychology. He gave priority to angularity, Ascendant, Sun, Moon, and MC. Astrologer 3 (male) had studied psychology, had written a book on astrology, and unlike astrologers 1 and 2 was a sidereal astrologer. He gave priority to planets, aspects and angularity. Astrologers 1 and 2 gave houses more weight than signs, whereas astrologer 3 gave them little weight. All scores, ratings, and chart judgements were reduced to a 3-point measure (introvert, ambivert, extravert). Here is the (rounded) correlation matrix:

	1	2	3	4	5	6	7	8	9	N
1 16PF		.65	.51	.53	.41	.38	.30	.29	.31	54
2 MMPI	.65		.50	.35	.48	.35	.09	.09	.12	53
3 MBTI	.51	.50		.46	.45	.35	.16	.00	.11	54
4 EPI	.53	.35	.46		.36	.18	.27	-.04	.20	44
5 JTS	.41	.48	.45	.36		.60	.14	-.11	.14	54
6 Self-rpt	.38	.35	.35	.18	.60		.17	.01	.02	54
7 Astrol 1	.30	.09	.16	.27	.14	.17		.28	.30	54
8 Astrol 2	.29	.09	.00	-.04	-.11	.01	.28		.41	54
9 Astrol 3	.31	.12	.11	.20	.14	.02	.30	.41		54

N varies because not all subjects completed all inventories. Mean correlations and *p* levels are:

Between inventories	<i>r</i> 0.471	<i>p</i> 0.0003
Inventories vs self-report	<i>r</i> 0.373	<i>p</i> 0.006
Inventories vs astrologers	<i>r</i> 0.138	<i>p</i> 0.32
Self-report vs astrologers	<i>r</i> 0.062	<i>p</i> 0.66
Between astrologers	<i>r</i> 0.329	<i>p</i> 0.015

Between astrologers the correlation is moderately high and significant. Between astrologers and inventories/self-reports the correlations are in the right direction but are not significant.

According to the inventories and self-reports, the relative numbers of introverts, ambiverts, and extraverts were more or less equal. However, Astrologer 1 found three extraverts for every two introverts, Astrologer 3 found the opposite, and Astrologer 2 found almost no ambiverts. There were 13 cases where all astrologers were in agreement, of which 6 agreed with the inventory majority and 7 did not. There were 6 cases where all inventories were in agreement, of which 2 agreed with the majority of astrologers and 4 did not. Of the three astrologers, the

worst was Astrologer 2 (the one low on ambiverts and the only one to achieve negative correlations), with Astrologer 3 (the siderealist) coming halfway between 1 and 2.

7.6.1981.3 Multivariate analysis of 53 alcoholics

Mark Urban-Lurain, MA thesis *A multidimensional model for evaluating astronomical concomitancies of human behavior* 1981. Reprinted as *Astrology as Science: A Statistical Approach*, AFA 1984.

Mark Urban-Lurain

1981
53
1981

Astrology As Science
a statistical approach

A literature search retrieved 25 quantitative studies of astrology, mostly on sun signs, all with either negative results or negligible effect sizes. Interpretation of both positive and negative Gauquelin results depended on prior beliefs. So "the only conclusion which can be drawn is that further research is necessary" (p.11). However, the retrieved studies all involved single factors, so a better approach to testing astrology would be to involve many factors simultaneously – an approach technically known as a multivariate analysis. But would it work?

To find out, the author made a multivariate analysis of the charts of 53 members of Alcoholics Anonymous and 217 members of the general population matched to the same year range (1921-49) and sex ratio (60% male) as the alcoholics. The chart factors were the angular separations (not specific aspects and orbs) between planets, Moon's node, angles, and Part of Fortune excluding those between the outermost planets, total 96 pairs. Plus house position of planets, Moon's node, Vertex and 8 Parts, total 20 (house system was not stated). The factors that were best at choosing alcoholics from controls, best first, were the angular separation of MO-AS, the house position of VE, and the angular separations PL-PF, MA-NE, SO-VE, SO-SA, ME-SA, and SO-MC. When the model classified the data from which it was obtained, it correctly classified 81% of alcoholics and 81% of controls.

Comment Such a result is typical even if the data be random numbers. No replication on a second set of alcoholics was made, so the model's performance cannot be assessed. However it correctly classified 72% of a second set of 230 controls matched for year range but not sex ratio, which does not avoid the problem of dependence on peculiarities in the alcoholic sample. Nevertheless the author concludes that his model was successful in picking alcoholics, and thus "supports the multivariate approach to research" (p.41). The study was written in thesis-speak and was often unclear. Thus variables labelled "aspects" on page 53 are actually angular separations. Françoise Gauquelin comments:

We miss in this work a clear view of what exactly has been evaluated. A mathematical model of this complexity, applied to a sample of only 53 data (which emphasizes the role of chance fluctuations), can produce results for various reasons. They may be astrological, but they may also be due to demographic, astronomical, etc., particularities of the target sample (*APP* 3(3), 45, 1985).

Also (1) Of the 116 factors tested, 70 involve angles, parts or house position and are therefore highly sensitive to birth time errors. Yet 49% of the alcoholics have birth times given only to the hour or half hour vs 29% for the controls (15% if born after 1930). So it is not clear if the results could mean anything. (2) The statistical tests assume the variables are independent. But of the 96 angular separations between the 15 points analysed, only 14 are needed to completely define the others. And a part is completely defined by its components. So most of the variables are not independent, making it even less clear if the results could mean anything.

(3) In the USA in 1980 alcoholism and heavy drinking were about five times more prevalent in men than in women. Unless we pretend that charts also indicate sex, then even if charts are 100% accurate for men they can be only 20% accurate for women, and vice versa. On average the maximum possible accuracy is therefore $(100+20)/2$ or 60%. On this basis the observed correct classification of 81% is too good to be true. (4) The results conflict with those of other studies (see next) that found no evidence that the chart relates to alcoholism. (5) The author does not explain how astrologers could use angular separations rather than individual aspects (this typifies Françoise's concern about lack of clarity).

Subsequently the author used half the Gauquelin data to derive a multivariate model based on the diurnal position and angular separation of ten planets, see *Correlation* 7(2), 2, 1987. It correctly classified 26.3% of the births in the other half vs 12.5% expected by chance, which is unsurprising because the data were already known to exhibit positive effects. An independent analysis of extreme E and N scorers found nothing that replicated, see 7.6.1985.2.

7.6.1982.1 Astrology and 100 alcoholics

Ann E Parker, *Astrology and Alcoholism: Genetic Key to the Horoscope* 1982.



The author tested 100 timed charts of alcoholics (most of them members of Alcoholics Anonymous) against 100 non-alcoholics born in the same year and usually the same month. A chi-squared test of sign, house, and aspect frequencies (300 comparisons are tabulated) indicated that the alcoholics had a significant ($p < 0.05$) excess of MC and Mars in Scorpio, Moon in Virgo, Sun in 8th house, and Moon-Uranus major (orb 5° or 10°) and minor (orb 2°) aspects, and a significant deficit of Jupiter in 12th house. Neptune aspected either the Sun, Moon or Mercury in 88% of alcoholic charts. Uranus aspected either the Moon, Mars or Jupiter in all alcoholic charts. All alcoholic 5th, 25th or 125th harmonic charts had Moon, Jupiter, Uranus or Neptune 0° , 90° or 180° to natal positions,

which "has opened the door to the use of genetic interpretation in natal charts" (p.140).

Comment The author's tests of significance do not take into account the large number of tests. If N tests are made, $0.05N$ results are likely to be significant at the $p = 0.05$ level by chance alone, thus providing "significance" where none exists. Especially when (as here) there is no replication. Furthermore her chi-squared results are inflated because they do not take into account the sampling variations in the controls. Thus the correct chi-squared test (2×2 with continuity correction) applied to her most "outstanding aspects" (0° , 90° , 180° on p.27) gives only non-significant results (compare last two lines):

Aspect	SO-NE	MO-UR	MO-NE	VE-MA	VE-PL	JU-PL	
Alcoholics	25	24	23	21	23	23	
Controls	16	14	16	14	13	15	
p by chi2	.01	.004	.06	.04	.003	.03	< author's invalid test.
p by 2x2 chi2	.16	.10	.28	.26	.10	.21	< valid test.

Gauquelin's 1981 study of 1794 alcoholics found Moon high in Virgo (167 vs 150 expected), but Jupiter was high in 12th house (160 vs 147 expected), which respectively supported and contradicted the author's result. A computerised replication that generated two sets of 100 charts (as in the author's study except the data were purely random) and repeated the comparison 800 times, got similar numbers of "significant" results, which did not support the author's claims (Dean, *Astrological Journal* 27(3), 179-182, 1985). In her 1975 PhD thesis *The use of the natal chart in the identification of alcoholism*, Suzanne Macharg gave the timed birth charts of 15 alcoholics and 15 non-alcoholics to ten experienced astrologers, and their MMPI profiles to ten experienced clinicians, and asked them to pick the alcoholics (they were not told how many alcoholics were in the sample). Mean hit rates were astrologers 50% (ie exactly chance), clinicians 56%, MacAndrew Alcoholism Scale (a sub-scale of the MMPI) 87%.

In 2005 US astrologer David Cochrane (*International Astrologer* 33(2), 33-35, 2005), who had been prompted by Ann Parker's and Urban-Lurain's results, reported finding by inspection that 167 alcoholics had fewer Saturn, Uranus and Pluto conjunctions with Mercury orb 16° in nine multiple-of-7-or-8 harmonic charts than did 27 mathematicians. He was impressed and felt his research was "among the most important ever done in astrology" (p.33). But the samples were very small, which (since the best factors were chosen by inspection) means that such results were not unexpected. There were no controls and no replication, so no conclusion is possible. There is nothing in any of the above results to suggest that astrology can detect alcoholism.

7.6.1982.2 Relevance of E and N to astrological symbolism

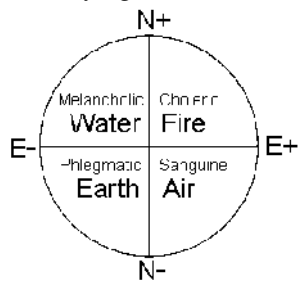
Doug Pierce, Symbolic perceptions of astrologers: a proposal, *Matrix Magazine* 8, 16-21, 1981. Proposal, not results. So unpublished results (dated August 1982) were obtained directly from the author. His is the only study we could find that directly tests how astrologers perceive the symbolism of chart factors and how they relate to each other.

US biostatistician and astrologer Doug Pierce circulated to over 3000 astrologers (mostly in the USA) a questionnaire asking them to rate on a 9-point scale the similarity between each of 29 chart factors (planets, signs, elements, qualities). Thus to rate the similarity between the meanings of Sun and Venus they would enter a number from 1 to 9. He then evaluated the perceived similarity between all possible pairs. Responses were obtained from 116 males and 153 females, mean age 43 years with a mean 13 years of experience. By astrology standards it was an unusually good sample. The results showed that the astrologers applied symbolism more or less according to tradition. Here are some results expressed as mean correlations:

0.51 sign and ruling planet*
 0.39 sign and element (FEAW)
 0.25 planet and element
 0.24 planet and signs of the same element
 0.18 signs of the same element
 0.12 signs of the same polarity (MF)
 0.03 signs of different element or different polarity

*For planets with dual rulerships,
 the correlations were ME-GE 0.56,
 ME-VI 0.42, and VE-LI 0.48, VE-TA 0.36.
 The higher of each pair indicating the
 rulership preferred by the astrologers.

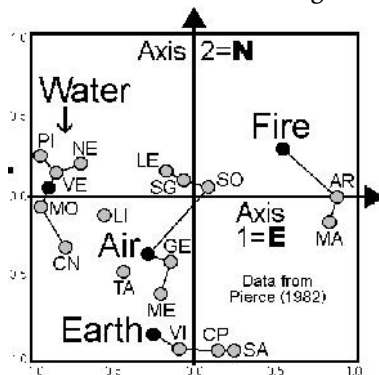
The above results show that the astrologers' use of symbolism was dominated by planet and element. The weakest correlations (indicating the greatest uncertainty in interpretation) were for the signs SC, SG, AQ and their rulers PL, JU, UR (mean $r = 0.12$, $p = 0.05$). Nothing coherent emerged for the three qualities (CFM), probably because their symbolism does not reduce to clear opposites like polarity (MF) or element (FEAW). A more important result arose from factor analysis of the 269 responses. Factor analysis is a mathematical technique that reduces a large set of data to a small number of underlying factors that explain most of the variation. For example factor analysis of behaviour in a restaurant might reveal two underlying factors, namely talking and eating, which would explain most of the behaviour.



Because the four elements underlie all astrological symbolism, and are identical to the four temperaments resulting from combinations of E and N, a factor analysis of astrological symbolism should in principle produce the four elements oriented as shown.

Hot-tempered Fire-Choleric is opposite reserved Earth-Phlegmatic.
 Easygoing Air-Sanguine is opposite anxious Water-Melancholic.

But the theoretical link between Air and Sanguine E+N- is upset by the modern view of Air (intellectual, communicative), which has little in common with Sanguine (active, easygoing). So in practice the outcome should be Fire,



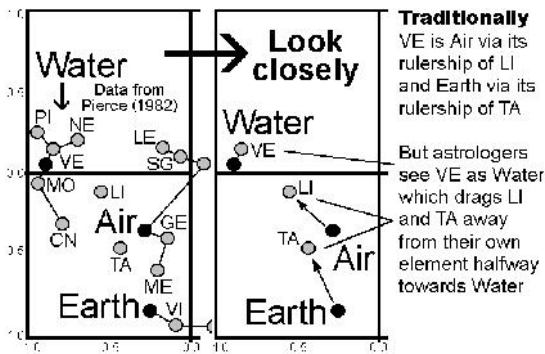
Earth and Water in their correct orientation, but with Air more like an independent third factor akin to cognition. Which is exactly what Pierce observed:

Horizontal axis: Axis 1 = E. **Vertical axis:** Axis 2 = N. The Air cluster is more or less in the centre, a position indicating little correlation with either axis. For clarity, items that correlate less than 0.6 with axes 1 or 2 are not shown except TA, LI, and the Air cluster.

The closer an item is to an axis, and the further it is from the centre, the more it relates to that axis. To identify what each axis means, look at the items closest to the ends of the axis and furthest from the centre (ignore the rest). (1) The items furthest from the centre have the clearest symbolism.

(2) The clearer the symbolism that two items have in common the closer they are together, for example AR & MA (E+) and CP & SA (N-). (3) Where clarity conflicts with tradition, clarity prevails. Thus according to tradition VE is Air via its rulership of LI, and Earth via its rulership

of TA, but in practice astrologers see VE as Water. This drags LI and TA away from their parent clusters towards Water. (4) More than half of the individual items correlate over 0.6 with an axis, which is notably high and shows that the axes are clear cut. (5) The coherence of



Fire, Earth and Water, and the independence of Air, is exactly as predicted. Axis 1 is related to E, and axis 2 is related to N, showing that E and N are as fundamental to astrological symbolism as they are to human personality.

Comment The above features (1) to (3) are exactly as expected, showing that symbols are effective only to the extent that they can be understood. Interestingly, Ptolemy classifies the triplicities not directly as FEAW but as a combination of the primary qualities associated with cardinal points.

Thus North is Cold, South is Hot (from the climatic regions in his part of the world), East is Dry, and West is Moist (from the humidity of the corresponding winds). This might seem to be a slender basis for the classification of people. But here the temperaments (EN combinations) come to the rescue, being based more on observations of real people than on flexible symbolic speculations, see the comments in 7.6.2017.1.

7.6.1982.3 Astrologers are not significantly maladjusted N=66

Michael Startup. Belief in astrology: A symptom of maladjustment? The unpublished part of his study in 7.6.1984.1.

Existing research has found that (1) people in San Francisco who were deprived and socially marginal tended to have more interest in astrology, and (2) belief in astrology among South African psychology students was positively correlated with suggestibility ($r=0.10$ $p<0.04$) and neuroticism ($r=0.37$ $p<10^{-6}$). Neither group was likely to be committed to astrology, whereas those who are strongly committed (ie serious astrologers) have not been studied.

To help fill the gap, Startup compared 33 male astrologers and 33 female astrologers (chosen at random from a larger number contacted via weekly AA lectures in London or AA regional study groups) with the same number of London University psychology students (also chosen at random from a larger number who had been tested during their first year). All 132 subjects had completed the EPQ and 16 PF (Form A) personality questionnaires.

The EPQ scores showed that male astrologers as a group were more tender minded (P-), more introverted (E-), and less neurotic (N+) than female astrologers as a group, but not significantly so. The astrologer scores were generally not significantly different from the mean scores for the general population or from those for the psychology students, although the astrologer P scores tended to be higher, ie more tough-minded, possibly reflecting their more unconventional interests. Correlations between 16PF profiles for astrologers and those for psychology students plus those for published comparison groups, were:

	<i>r</i> vs Astrologers		
Experimental group	female	male	
Astrologers male	0.76	1.00	) All <i>p</i>) values) <0.01.
Psych students female	0.72	0.55	
Psych students male	0.57	0.71	
Comparison group			
Academic psychologists male	0.04	0.03	
Roman Catholic priests	0.01	0.01	
General neurotics	-.41	-.36	
General psychotics	-.41	-.29	
Inadequate personality	-.33	-.22	

The above results for 16PF profiles show that Startup's male astrologers were similar to psychology students; dissimilar to neurotics, psychotics and inadequate personalities; and not

noticeably similar to academic psychologists or Roman Catholic priests. Startup concludes:

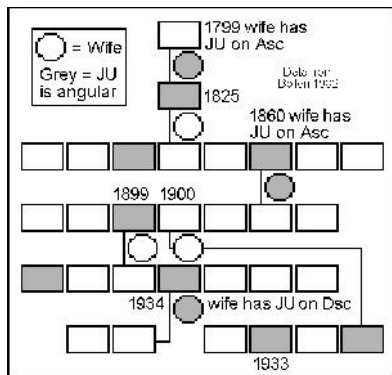
People who not only believe in astrology but also study the subject seriously in general show no signs of maladjustment. ... While the majority of people who profess a belief in astrology may be poorly adjusted and socially deprived, those who carry their belief into dedicated study do not have these characteristics.

Comment Sample sizes were not huge but they were large enough to detect any differences of practical significance. The results suggest that, as with most groups, differences between astrologers are more important than differences associated with astrologers as a whole.

7.6.1982.4 Jupiter and five farmer generations 1799-1939

Marian Bollen, *Astro-Psychological Problems* 1(1), 10-13, 1982.

When some years ago I began my research into astrological heredity, I was able to collect from registry offices the complete birth data for five generations of a family that farmed an estate in the south-east Netherlands. Originally I was looking for Saturn and Neptune links because of analogous events in their history. As it happened these links were not confirmed, but I found that in 34 charts an angular Jupiter (ie close to Asc or MC axes) was present 11 times despite a small orb (5°), which seemed to confirm the links that Gauquelin had found for Jupiter.



The author's results for five generations are here replotted with angular Jupiters in grey to make them easier to follow (11 out of the total 34).

It was of course important to know:

whether the Jupiter position is more crucial *before* or *after* the angles, but ... it is impossible to know with birth times rounded off [by the registry office] to the next hour or half-hour (p.13).

As a control I studied 16 charts of two generations of another family, and found eight with an angular Uranus, which was descriptive of the family's rough independence. Therefore I concluded that birth charts show evidence of genealogical links.

Comment The effect of rounding birth times to an hour or half hour will depend on whether the relevant sign is ascending slowly or rapidly, but for a maximum error of half an hour the average error in angular positions will be something like $360^\circ \times 0.5/24 = \pm 8^\circ$, which makes counting planets close to angles within 5° very uncertain. Yes, the number of angular Jupiters observed over orb intervals of $0.0-4.9^\circ$ and $5.0-9.9^\circ$ were 11 and 3 respectively vs about 3.8 expected in each case, which may seem encouraging – except that, out of 10 available planets, Jupiter was chosen because it was the most frequently angular in the first place. So it could easily be the most frequently angular purely by chance.

But the problems do not stop there. As shown above, only a tiny proportion of the descendants from the ancestral 1799 couple were examined. So how many were not examined? To simplify the calculations, assume that each couple produces the same number of surviving children, who in turn marry and produce their own family with the same number of surviving children. The total number of descendants from the ancestral couple is then:

(Number of surviving children per couple)^G where G = number of generations

which for one generation is just the assumed number of surviving children. In the present case of five generations and say five surviving children per couple, the total number of birth charts is 5^5 or more than 3000 (not a misprint), of which only 34 (1%) have been examined. So what are the Jupiters like in the 99% we did not examine? Obviously we have no idea, which leaves us with little justification for drawing firm conclusions from the 1% we did examine.

In other words we have no way of telling if the author's result is due to chance or to genuine astrology or to wishful thinking (and the same for her angular Uranus result).

However, Gauquelin's 1984 failure to replicate his 1966 heredity results despite his enormous sample of 33120 parent-child comparisons suggests that astro-genealogical effects exist only in wishful thinking. Thus the modest (even by Gauquelin standards) effect sizes calculated as phi for frequencies in key sectors in his original 1966 experiment (here a rough approximation to angular frequencies) had not merely got smaller, they had disappeared:

Year	N	MO	VE	MA	JU	SA	Mean	
1966	16034	.016	.024	.024	.008	.010	.016	N = number of comparisons, not total number of cases.
1984	33120	-.001	-.004	-.003	-.002	.004	-.001	

Data from M Gauquelin, *Planetary Heredity* ACS San Diego CA 1988 See also 6.6.6.

7.6.1982.5 Statistics and the astrology of rare gifts

Geoffrey Dean, *Astrological Journal* 24(1), 36-42, 1982. Or what to do before the statistician arrives.

One feature of modern astrology is the statistical study of people who have in common a particular ability, occupation, or attribute. Such studies tend to be ignored by astrologers because their obsession with numbers during chart calculation seems to disappear when it comes to statistical analysis. But there is a little-known and much easier alternative:

If chart factor X (either alone or in combination) distinguishes gifted people from non-gifted people, the obvious question to ask before anything else is: *does the frequency of X in charts match the frequency of gifted people?* If it does not then we immediately have problems. For example if our factor X suggests that 1 in 10 of the population are gifted when the actual proportion is 1 in 10,000, we will most likely be right only once in a thousand readings.

But this need not complicate our research into gifted people for a surprising reason:

N studies for the price of one

If our reading is to be reliable, the proposed factor X must be both present in gifted people and absent in non-gifted people. Suppose there exist N rare gifts (or abilities or achievements or any rare attributes). Rather than make N studies to examine each gift separately, we can examine charts of people with none of the N gifts. If proposed chart factor X (either alone or in combination) is not absent in every non-gifted chart, then none of our N studies could have led to a reliable reading. In other words we have done N studies for the price of one.

Non-gifted people need not be hard to find. If each of say 10 rare gifts exists in say 1% of the population, then on average $0.99^{10} = 0.90$ or 90% will have no gifts, which should be much easier to find than the 1% who are gifted. If we optimistically increase the number of rare gifts to say 100, then on average $0.99^{100} = 0.37$ or 37% will have no gifts. Alternatively, if their frequency is one in a million (so the gift is really rare), the average proportion with no gifts is 99.99%. So in each case the same argument applies. It becomes less applicable as the gift becomes more common, as when each of say 20 gifts exists in say 10% of the population ($0.90^{20} = 0.12$ or 12%), but then the gift is no longer rare.

The above calculation assumes each gift is independent and is distributed normally in the population, which may or may not be the case, but this does not affect the underlying principle of testing the absence of gifts.

Sample size

But how large does our sample have to be for a reliable result? If S is how sure we want to be about the result (say 95%, $S = 0.95$), and P is the prevalence of each gift (say 1%, $P = 0.01$), it can be shown that the minimum sample size is $\log_{10}(1-S) / \log_{10}(1-P)$. So for this example the minimum sample size is $\log_{10}(1-0.95) / \log_{10}(1-0.01) = -1.301 / -0.00436 = 298$. In other words if we want chart factor X to be relevant to any of the 100 gifts that each occur in 1% of the population, and X does not appear in any of 298 non-gifted charts, then we have a 95% chance of being successful. If the gift is really rare, say one in a million, the required sample is correspondingly increased (in this case to nearly three million). But if it does appear in our sample or in a replicate sample, we can be 100% certain that X cannot be used to reliably predict any of the gifts regardless of whether X is simple or complex.

In other words this approach will reliably indicate what won't work but not what will work. And it will apply only if X is chosen in advance, simply because it will on average find $(1-S)\%$ of all possible Xs to be absent by chance alone. If the pool of possible Xs is large then there will be a correspondingly large number of absent Xs, but we will have no way of knowing whether their absence is due to chance or astrology. So if this approach is used to home in on likely Xs then an independent check by replication is essential – a small price to pay in return for doing N studies in one hit. Every replication would relentlessly narrow the search, and the result would be either success or the painting of ourselves into a corner.

Complications

At which point various complications suggest themselves. How can we be sure a gift is absent? What about gifts that are linked to other gifts or are shades of grey rather than black or white? How can we be sure our pool of possible Xs is sufficiently large? Such complications are a challenge, but surely not more than the challenge of testing each gift directly.

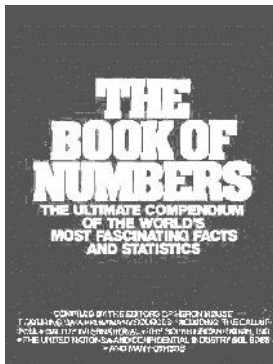
For example Peter Carruthers (*Astrology*, 45(2), 56-57, 1971) looked at 243 cases of "people with some form of psychic power", whatever that means, focusing on signs and aspects. The most frequent aspects were SO-60-MA, ME-0-MA, VE-0-NE, and the least frequent was SO-180-MA. There were no controls or statistical tests. But his results suggested that the ideal psychic chart would have SO and VE in Taurus, MO in Pisces, ME and MC in Aries, MA in Virgo or Capricorn, JU and SA in Capricorn, Asc in Leo. Which may be all very interesting but not to an astrologer with clients wanting to know if they have a psychic gift.

Nor is it the least bit helpful to argue (as many astrologers do argue) that X is related not to a particular gift but to *potential* gifts, along the lines of Dennis Elwell's memorable "picture on the seed packet". To see why, think of running. We can all run, therefore we are all potential four-minute milers. But in reality very few are – which is why we want to know yes or no. Being told that we are potentially good at running is not exactly helpful, although it might be if running came top of our various potentials and was a practical possibility.

Hopes for the future

Of course tendencies are generally all we currently have. No amount of talent can guarantee success unless we have the necessary interest or the capacity for hard work (and of course vice versa). Unless astrology can identify gifts at a more certain level than just "tendencies", unless it can bring some clear advantage like consistency, it will be a non-starter.

To the extent that nobody has found a factor that consistently stands out in gifted charts (and many have tried for all sorts of gifts) or noticed a consistent lack of any factor in non-gifted charts (which may of course be because nobody has really looked), so must our hopes be diminished of ever seeing astrology as a reliable tool for predicting gifts. Until this happens anyone wanting to know if they have unusual gifts is better off using approaches other than astrology. Which does not deny that an astrologer using psychic gifts (if they exist) cannot draw correct conclusions from uncertain or wrong factors in uncertain or wrong charts, but then who needs charts?



To recap. Whatever the gift, ability, achievement, or attribute, we should first determine its frequency in the general population because this will give immediate clues to the kind of chart factors that could be relevant. Thus different factors would be involved for mediumship (say 0.01%), schizophrenia (1%), musical ability (5%), and anxiety (50%). But no list of frequencies has been produced by astrologers, so here is an opportunity for someone in astrology to make a crucial contribution to astrological research. Perhaps the next best thing is a book like *The Book of Numbers* 1978 with 464 pages of tables listing "facts, foibles and fancies of people the world over".

That said, the assumption that frequency in the general population is constant over time is clearly unwarranted, as is the assumption that things like musical ability and anxiety are a yes/no situation. It is known that most (if not all) human abilities follow a bell-shaped distribution, which means we are shades of grey. So it would be unrealistic to assume that astrological indications cannot also be shades of grey. But we cannot have grey without also having black and white. In other words the existence of shades of grey requires only that X exists as a variable quantity, a not impossible requirement since this is what both orbs and multiple factors are all about. They do not let us off the hook of having to identify X.

There are still problems even when the assumptions are true. Thus many athletes have broken the four-minute mile since the record was set by Roger Bannister in 1954. And over the centuries infant mortality and average life expectancy have varied widely with country and social class, whereas the heavens have not. Consider also fish spawning, where billions may be born within a few hours or less in the same location, yet contrary to what astrology might predict their longevity is highly variable. There is more bad news:

The world's population now exceeds seven billion (7×10^9) and to maintain it requires about nine births every second (see 3.14). How many factors are required for each of nine charts per second to be unique? And that is just for human beings. To maintain their world populations chickens and brown rats each require about 20 thousand births a second, while the world's most abundant fish (Bristlemouth living in the depths 1 to 2 km down) needs more than 30 million births every second. The prospects for astrology making sense do not seem good.

The above numbers are calculated as follows (data via Google searches):

World rat population is about 10 billion (10^{10}), with 95% mortality in the first few weeks. Most survivors last for one year. If mean lifespan is say two months, then 10 billion rats need replacing every two months, say every 60 days, or

$$10^{10}/(60 \times 24 \times 60 \times 60) = 19290 \text{ a second.}$$

World chicken population is about 20 billion, most are broilers (lifespan 5-7 weeks), maybe 5% are egg-layers (lifespan about a year). About 60 billion are slaughtered worldwide each year and need replacing, or

$$60 \times 10^9 / (365 \times 24 \times 60 \times 60) = 19025 \text{ a second.}$$

Bristlemouth fish are the world's most numerous fish. They live in the depths 1km to 2 km down and are therefore hard to study. Estimated number is 500,000 billion (5×10^{14}). Average lifespan is not known but assuming it is about the same as sardines (roughly 5 years), then replacement needs

$$5 \times 10^{14} / (5 \times 365 \times 24 \times 60 \times 60) = 31,709,792 \text{ a second.}$$

Sardine shoals can be $7 \times 1.5 \text{ km} \times 30 \text{ m}$, or 0.3 *cubic kilometres* in volume and contain billions of sardines. Let C = sardine survival rate, B = number of young, P = survival rate to reproduction. For constant population size, $1 = CB + CBP (+ CBP^2 + \dots \text{ if there is more than one reproduction})$. If B is large and there is only one reproduction, or if P is small, then $C \sim (1-P)/B \sim 1/B$. A female spawns once per season, releasing about 75,000 eggs.

World population of cows, sheep, pigs, goats is 1 billion each. Cats, dogs, sparrows 0.5 billion each. The most abundant bird (Quelea) 1.5 billion. Ants (all kinds) 100 million billion. Krill 500 thousand billion.

7.6.1982.6 Is the Barnum effect enough to explain astrology?

Colin Grange. The Barnum Effect: Its relevance for non-scientific methods of personality assessment. Unpublished paper, Loughborough University of Technology, 1982. Notable for involving an astrologer and a graphologist.

Grange begins by reviewing twenty studies of the Barnum effect. They show how:

it is possible for astrologers and graphologists to use invalid methods of assessing personality yet still have their client believe that the descriptions they give are very accurate (p.21).

Which is why psychologists see the Barnum effect, a hidden persuader arising from our ability to read personal meaning into generalities without realising what is happening, as explaining why clients accept chart interpretations. Astrologers unanimously say no to that one, believing (without conducting their own tests) that it could not possibly account for the accuracy they personally experience every time they read a birth chart. So who is right? (This was before many other hidden persuaders were also known to encourage chart acceptance, see 9.8.)

To find out, Grange tested 24 students (17 female 7 male) taking an introductory social psychology course at Loughborough University of Technology, and 27 students (21 female 6 male) at Loughborough College of Art and Design. Both groups were from their full class enrolments and were those who knew accurately their time, date and place of birth. Each subject completed the EPQ and the Firo-B (how a person works best in different situations, used here as a cover for the Barnum statements), and provided a sample of their handwriting on unlined paper. Two months later each subject received four interpretations and had to rank them in decreasing order of accuracy. The interpretations were:

- The 13 original **Barnum** statements widely used by others, see 7.6.1980.4.
- A set of 13 statements obtained by combining selected **EPQ** questions with the subject's own response. The result was essentially the subject's own description of themselves in selected areas, not an actual EPQ score.
- An interpretation of the subject's chart by a professional **astrologer** and expressed as 13 statements.
- An interpretation of the subject's handwriting by a professional **graphologist** and expressed as 13 statements.

Each subject was told that two of the interpretations were based on the psychological tests (EPQ and Firo-B), one on astrology and one on graphology, but not which was which. Here are the mean lengths for each interpretation, and five typical statements for the same subject:

EPQ (mean 100 words)
Your mood often goes up and down.
You are a talkative person.
Your feelings are easily hurt.
You do not prefer reading to meeting people.
You do not worry a lot about your looks.

Barnum (all had the same 185 words)
You have a tendency to be critical of yourself.
While you have some personality weaknesses, you are generally able to compensate for them.
Disciplined and controlled on the outside, you tend to be worrisome and insecure inside.
Some of your aspirations tend to be pretty unrealistic.
Security is one of your major goals in life.

Astrology (mean 80 words)
You have an individual unconventional approach to life.
You have a tendency to be impatient.
You have a good imagination.
You like to keep out of the limelight.
You tend to keep coming across people who are against you.

Graphology (mean 260 words)
You want to be independent, self-controlled and self-reliant.
You are more sensitive than you like to discuss.
Your personal and social relationships are approached with a cheerful and usually optimistic outlook.
On the outside you manage to give a good sense of self-esteem, but within there is a small facet of inner insecurity.
By nature you are not hostile and only in really adverse conditions will you show any real aggression.

The mean rankings (1 = most accurate, 4 = least accurate) and *p* values were:

Interpretation	Rank N=24 Psych			Rank N=27 Art & D			<i>p</i> N=24 vs N=27
	Mean	SD		Mean	SD		
EPQ	1.92	0.97		1.96	0.92		0.88
Graphology	2.33	1.13		2.26	1.17		0.83
Barnum	2.33	1.05		2.63	0.95		0.29
Astrology	3.42	0.78		3.15	1.04		0.30
<i>p</i> vs		Graph	Barn	Astr	Graph	Barn	Astr
EPQ	0.18		0.17	<.0001	0.30	0.011	<.0001
Graphology			0.99	0.0003		0.21	0.0047
Barnum				0.0002			0.061

SD = standard deviation. *p* values by two-tailed *t*-test of means and SDs.

The two groups of subjects (N=24 and N=27) were in close agreement. Of the four interpretations, both groups ranked what were essentially their own self-descriptions as the most accurate (which of course is not surprising), and the astrology interpretations as the least

accurate, the difference in almost every case being significant or highly significant.

But was the Barnum effect enough to explain why such interpretations are accepted? Barnum was ranked slightly lower than graphology, but not significantly ($p=0.99$ Psych, 0.021 Art & D), and significantly higher than astrology ($p=0.0002$, 0.061), so in both cases the Barnum effect was enough to explain their acceptance. Could length have been a factor? No, because the two shorter interpretations (EPQ and astrology) had the highest and lowest means, while the two longer interpretations (Barnum and graphology) had very similar means.

Comment 1 And even Grange's longer interpretations were much shorter than those usually provided by astrologers or graphologists. For example his average of 80-260 words per interpretation compares with the 300 words *per factor* in the popular *Planets in X* books published by Para Research in the 1970s, where $X = \text{Aspect, Composite, House, Love, Transit, Youth}$. And his 13 sentences per interpretation (6-20 words per sentence) compares with the typical 260 sentences of the best-selling *Astro*Intelligence* interpretations (nearly 30 words per sentence) see 8.6.11. The problem with concise descriptions is that errors are easily spotted, so to avoid the chance of being clearly wrong just add a smokescreen of long words and long sentences.

Grange is careful to point out that his study tested just one astrologer and one graphologist, so the results reflect two individuals rather than the principles of astrology and graphology. He also points out that Barnum effects are effective, not because people are gullible or because they cannot tell the difference between right or wrong statements, but because every Barnum statement tends to fit them and therefore they cannot help but judge it to be accurate. The reason people accept Barnum statements (other than they tend to fit) is simple:

they do not have a more specific description to compare it with and thereby decide which of the two is the most accurate (p.37). [This applies] when a person is given only one description of their personality to assess (p.44).

Which of course is the case for anyone who consults an astrologer, palmist or graphologist.

Comment 2 In other words judging astrology by the apparent accuracy of its interpretations (a process called personal validation) is totally inadequate. Yet astrologers see it as the gold standard by which astrology should be judged. They do not (or will not) understand:

why the psychologist is not convinced by testimonials from satisfied clients. Their decades of experience ... seem to them fully adequate proof of their skill (Allport and Vernon, *Studies in Expressive Movement* 1933:209).

That was in 1933. Yet astrologers have resolutely failed to listen. For example in 1992:

There is no greater proof of astrology's validity ... than its daily application in clinical practice (Dr Glen Perry, founder and president of the US Association for Psychological Astrology, *Astrological Journal* 34(3), 139-146, 1992).

No wonder that astrologers in general are opposed to anything like the above test and others in this book that shows how their claims collapse when Barnum effects are controlled.

7.6.1983.1 Astrological aspects between 960 married couples

Thomas Shanks, *APP* 2(1), 12-16, 1983. Reprinted in *Kosmos* 14(1), 16-26, 1985, see also 14(2), 14.

In 1952 Carl Jung compared astrological factors between 483 married couples divided into three groups. There was a tendency to favour Moon conjunct Moon, which agreed with tradition, but it did not replicate, and his statistics (which assumed uniform distributions) were inadequate, see 7.6.1952.1. The author therefore repeated Jung's experiment with 960 married couples chosen at random from Gauquelin's first heredity experiment, and compared the observed frequencies of conjunctions and oppositions (orb 10°) between all possible pairings of Sun, Moon, Ascendant and MC, with those for the same couples in 199 sets of random pairings. According to tradition the above pairings should be prominent between married couples. But none reached the same prominence as in Jung's results, and none were even marginally significant. There was a fairly uniform distribution of significance levels across the entire range from 0 to 1, which is as expected if there were no astrological effects.

Shanks's conclusion: the frequency of these factors does not differ between married couples and unmarried couples paired at random. **Comment** An earlier test by Arno Müller (*Zeitschrift für Parapsychologie und Grenzgebiete der Psychologie* 2/3, 93-101, 1957/1958) reached the same conclusion for 300 married couples and 300 divorced couples. Müller's observed frequencies for female Moon for aspects of orb 8° (with Jung's for comparison) were:

	Married	Divorced	Jung for N=300
Conjunct male Sun	10	19	21
Conjunct male Moon	20	17	28
Opposition male Sun	15	14	21

None of Müller's six results above are significant at $p \leq 0.05$ (average p is 0.3). Jung's high frequencies (including female Asc – male Moon) were not observed.

7.6.1984.1 Personality scores vs aspects for 911 subjects

Michael Startup, PhD thesis *The Validity of Astrological Theory as Applied to Personality, with Special Reference to the Angular Separation between Planets*, London University. Perhaps the best sympathetic-but-rigorous British PhD thesis on empirical tests of astrology. His analysis of sun signs was the first known application of meta analysis to astrology.

My research used a sample of 911 subjects all with time, date and place of birth, of which 562 were university students. The rest were astrologers or students of astrology. Mean age was 29 years, 33% males. 61% of birth times were reported to within 15 minutes or better, 39% to the nearest hour or worse. They had completed Eysenck's EPQ and Form A of Cattell's 16PF to give scores on 10 separate (but not perfectly independent) personality scales including extraversion, neuroticism, psychoticism, independence, and self-control. Existing research has concentrated on signs and houses but not aspects. So in four of my studies I investigated aspects.

1. 10 members of the London AIR group (see 8.1.2) predicted the extent to which each personality scale related to each hard/soft/neutral major aspect between all possible pairs of planets excluding mutual aspects between SO-ME-VE and between JU-SA-UR-NE-PL, a total of 32 pairs, orb 7.5°. I then tested their predictions against the data. Of 133 tests, only 44 (33%) were in the predicted direction, and only three were significant at $p = 0.05$, which was within chance expectation.

2. Same but with multivariate analysis to test the difference between hard and soft groups, and between aspects and no aspects. Of 32 tests only one was significant (MA-UR, $p = 0.01$), which was within chance expectation.

3. Division into groups depending on whether the 108th harmonic for SO-MA, SO-JU, SO-SA, and SO-UR coincided with a peak or a trough in Addey's 1976 results for nonagenarians, a study that had led him to the idea of harmonics. Of 40 tests only one was significant ($p = 0.05$), which was again within chance expectation.

4. Division into multiple-of-15° aspect groups followed by multivariate tests of the difference between groups. Of 32 tests only three were significant at $p = 0.05$, for which the binomial probability is $p = 0.21$, so again the result was within chance. In other words none of the results gave evidence for the validity of astrological aspects.

In further studies I tested:

5. A total of 23 predictions re personality links with planets in Gauquelins' key sectors. Three predictions were supported but only two of them were marginally significant. However, all three effects had been found on at least two previous occasions.

6. Whether personality varies in any manner according to sector. Significant effects were found only for the Sun.

7. Whether personality varies with signs of the zodiac according to planet. The only reliable result was for the Sun and extraversion, which replicated some existing studies, see 8.3.7.

8. Existing sun-sign studies by meta-analysis, for details see 7.1.1984.2. The results confirmed the reality of the self-attribution effect, which appears to be akin to a self-fulfilling prophecy.

Conclusion Both the previous and the present research into zodiac signs and aspects have failed to find any clear evidence for their validity. So further research should concentrate on the diurnal circle instead (ie on Gauquelin's planetary effects). There appears to be no reason why better evidence for these planetary effects should not be forthcoming if sufficiently large samples of subjects with timed births are tested.

Comment The author's failure to validate aspects despite a large sample and powerful tests agrees with Niehenke's failure to validate aspects with an even larger sample, see 7.6.1987.3.

7.6.1984.2 Astrology and 1043 ballet dancers

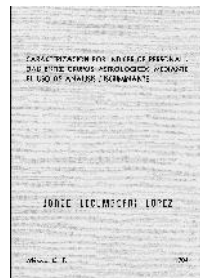
Ian Ferguson, *Stars of Dance* 1984.

Can astrologers predict the chart factors that relate to outstanding success in dancing? Timed birth data for 1043 ballet dancers were obtained by writing to 6000 dancers. Twelve famous dancers or dance directors each nominated six traits required for outstanding success in dancing. The results condensed to 20 traits clustered around *determination* and *artistic sense*. The chart factors corresponding to these 20 traits were then nominated by each of three qualified astrologers to give a total of 60 factors (albeit often in disagreement), for example *driving ambition* was associated with an angular MA or JU; with SO in AR or aspects to MA; and with an emphasis on SO, MA, PL, AR, LE, SC, 1st, 5th, 8th, or 10th house. Computer analysis of several thousand factors for 1043 dancers vs 510 non-dancers showed that dancers were higher in six nominated factors (MO-NE, ME-SA and MA-JU aspects, VE and JU in SC, SA seldom on IC), and five non-nominated factors (ME-UR and VE-SA aspects, SO or MA on IC, UR on MC). Midpoints vs those given in Ebertin's *Combination of Stellar Influences* as "indicative of art" (not just dancing) showed that (1) many high-scoring midpoints for dancers were absent from Ebertin's list, and (2) many midpoints in Ebertin's list were higher for non-dancers.

Comment There is no replication, controls, or statistical analysis, so the results are difficult to assess. O'Neill and Kollerstrom (*Correlation* 6(2), 53-54, 1986) find the emphasis on MA-JU aspects is an artifact of astronomy. Even if a high proportion of dancers have X in their chart, it doesn't mean that having X will make you a good dancer. Nor will expanding X to include say 100 factors make any difference when juggling 100 factors is well beyond anyone's ability.

7.6.1984.3 MMPI scores vs chart factors for 191 subjects

Jorge Lecumberri López, *Caracterización por índices de personalidad entre grupos astrologicos mediante el uso de analisis discriminante* [Characterisation indices between astrological personality groups using discriminant analysis], 167 pp in Spanish, self published Mexico 1984, and personal communication 1985. A superprize entry see 9.11.



The Minnesota Multiphasis Personality Inventory was given to 191 normal subjects in Mexico City who knew their date of birth and were not familiar with psychological tests. Mean age was about 25, range 17-55, proportion of males was not stated. At the time (1984, it was revised in 1989) the MMPI had 566 questions to measure personality on ten scales (hypochondriasis, depression, hysteria, psychopathy, femininity, paranoia, psychasthenia, schizophrenia, mania, introversion) and three scales to measure test-taking biases (lying, carelessness, faking).

Hypochondriasis = debilitating anxiety about health or illness. *Hysteria* = exaggerated or uncontrollable emotions. *Psychopathy* = callous, antisocial behaviour. *Psychasthenia* = phobias, obsessions, compulsions, excessive anxiety. *Schizophrenia* = abnormal social behaviour, failure to understand reality, false beliefs. *Mania* = manic, abnormally high arousal. The author cites two Charles Carter books (*Principles* and *Aspects*), but not his *An Encyclopaedia of Psychological Astrology* which gives significators for many behaviours related to the above ten such as anxiety, callous nature, melancholy, and obsession. So it would seem reasonable to expect some correspondence with MMPI scores.

The multiple discriminant analysis looked at scores on all 13 MMPI scales together, and then retained the scales that best discriminated at the $p \leq 0.05$ level between these chart factors:

1. The 2 polarities, 3 qualities, and 4 elements of Ascendant and eight planets (not NE or PL), total $1+10-2 = 9$ chart factors counted in terms of Ascendant and planets.
2. The 12 signs of Ascendant and ten planets including NE and PL, total $1+10 = 11$ factors.
3. The 12 “harmonics” and 12 “decanates” of nine planets (not PL), total $9+9 = 18$ factors.

A “harmonic” has each sign divided into three 10° sectors in zodiac order starting with AR (AR-TA-GE), TA (CN-LE-VI), GE (LI-SC-SG), CN (CP-AQ-PI), and so on. A “decanate” has each sign divided into three 10° sectors in element order (starting with AR (AR-LE-SG), TA (TA-VI-CP), GE (GE-LI-AQ), CN (CN-SC-PI), and so on.

4. The 44 planetary pairs (excluding NE-PL) using multiple-of- 30° aspects and 15° orbs.

Neither the large 15° orb, nor treating all aspects the same regardless of differences such as hard vs soft, is usual in normal everyday practice. But both were required to give an adequate number of observations.

The number of MMPI scales retained to show the best discrimination was 1–5, typically 2. Total chart factors tested = 56 sign-related (1-3) and 44 aspects (4), total 100. For each of the subjects each factor was expressed as yes (present) or no (absent). The approach is unusual in that it asks whether MMPI scores can discriminate between the yes and no groups for each of the 100 chart factors, not the (more usual) other way round. For example do hysteria scores (uncontrolled emotions) predict whether people will have the Sun in negative signs? (yes). Do depression scores predict whether people will have Moon-Saturn aspects? (no).

The results showed that discrimination was possible at the $p \leq 0.05$ level for 31 of the sign-related factors and 23 of the aspect factors, total 54. The author concludes that this provides support for astrology, and that “Astrology is opening its doors to the verifications that can be made in this area, the field is full of possibilities and surprises, with answers waiting to be discovered over time. Statistics has become a great tool for research in astrology” (p.164).

Comment The total number of tests is 13 scales $\times$ 100 factors = 1300, so the number of results expected by chance at the $p = 0.05$ level is $0.05 \times 1300 = 65$. The difference from 54 is in the wrong direction and is not significant ($p = 0.35$ by 2×2 chi-squared test). Sign-related factors ($p = 0.58$) were no better or worse than aspects ($p = 0.51$). There were no significant sign-related results for the Ascendant. There were no controls and no follow-up tests to see if the results replicated, so as it stands the outcome was in accordance with chance.

7.6.1985.1 Can astrology predict E and N? Individual factors

Geoffrey Dean, *Correlation* 5(1), 3-17, 1985.

E is extraversion and N is neuroticism (not to be confused with N for sample size). Both E and N exist as a continuum between (+) and (–). E+ is sociable and outgoing. E– is quiet and reserved. N+ is emotional and easily upset. N– is calm and not easily upset. E and N were chosen because they are among the most major and enduring of known personality factors:

See Eysenck HJ and Eysenck MW (1985). *Personality and Individual Differences: A Natural Science Approach*. Plenum, New York. With 1200 references. Readable, very relevant to testing astrology.

Thus E and N emerge from personality and laboratory tests of all types, even those without E and N in mind. They are found in all cultures including non-Western cultures, even in animals. They are visible in ancient personality descriptions such as the four temperaments, see 3.4 and 7.6.2017.1 comment, which makes them even more suitable for testing astrology. In another survey, see 7.6.1986.3, 86 astrologers rated E and N as readily discernible in birth charts.

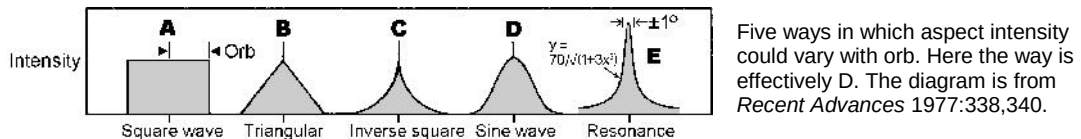
To test whether astrology can predict E and N in ordinary people, 288 subjects with extreme scores on the Eysenck Personality Inventory (and no significant Lie score) were selected from 1198 subjects. All births were timed. 105 were from the author and 183 were from researchers who had published EN-sunsign studies using timed births and were willing to share their data. The result was two replicate sets, each with 54 extreme subjects for each of E+, E–, N+ and

N– (the sample of 288 is less than $2 \times 4 \times 54 = 432$ because some subjects were extreme on both E and N). The average pair of opposite extremes was equivalent to the two most extreme persons in a random sample of 15 adults, or much more extreme than the 2 out of 3 commonly used in experimental psychology. Age distribution (range 15-66) was similar to that in the adult population, 72% were female, 85% were born in the southern hemisphere.

The following factors were computer-tested by Colin James III in Denver CO: tropical signs, decans, elements, sidereal signs, zodiacs, aspects, harmonics, hemisphere, angularity and Gauquelin plus zones. If astrology predicts factor X indicates say E+, then the frequency of X should be higher in extreme E+ subjects than in extreme E– subjects. Of a total of 132 tests, 58 results were hits vs 66 expected by chance (or 61 allowing for ties), and 12 results were significant at the $p = 0.10$ level vs 13 expected by chance. Only sun signs vs E gave replicable results (effect sizes 0.07 and 0.15) reflecting the known self-attribution in the parent samples. Conclusion: none of the other chart factors are related to E and N even in extreme subjects.

But how would the factors perform if tested in combination? To find out, a total of 75 chart factors were tested by Thomas Shanks of ACS in San Diego CA using the same subjects and multiple discriminant analysis, a computerised technique that finds factors that discriminate best between a set of charts and controls. In effect it does what an astrologer does, but always consistently and always using the optimum combination of factors.

The factors tested were sign position of planets, Placidus house position, quadrant position, Gauquelin planets in plus zones, angularity orb 10° , aspects orb 7.5° , and midpoints orb 2° . Strength of the last two was calculated as $\cos(12 \times \text{orb})$ and $\cos(45 \times \text{orb})$ respectively, so the aspect was strength 1 at 0° , 0 at maximum orb, and 0.76 when halfway. When the 18 factors that best discriminated between opposite extremes were used to predict E and N in the same charts used to derive them, the average accuracy for the four sets of extremes was 84%.



However, given enough factors (here 75) there will always be some that discriminate one set of data from another by chance alone. The question is: do they replicate? If the 18 factors in combination genuinely relate to E or N, then the number of factors common to the original and replicate sets should be significantly greater than chance. In fact the observed number of factors in common was two for E and five for N, both vs 4.2 expected by chance. A common factor could even act in opposite directions, for example planets-and-angles in GE indicated E+ in one set and E– in the other. Conclusion: none of the chart factors predict E and N, either individually or in combination.

Comment Astrologers pointed out that the study ignored the skills that only an astrologer's experience and intuition can bring to a consultation. But was failure inevitable? See next.

7.6.1985.2 Can astrology predict E and N? The whole chart

Geoffrey Dean, *Correlation* 5(2), 2-24, 1985, a study described by Martens and Trachet in their 1998 book *Making Sense of Astrology* as "unequalled in its range, carefulness, thoroughness, and extensiveness" (p.192), but rarely mentioned in astrology books. Includes results not reported in the original *Correlation* article due to lack of space.

To test whether astrologers using the whole chart can predict E (extraversion) and N (emotionality) in ordinary people, the charts of 160 subjects with extreme scores on the Eysenck Personality Inventory were judged by 45 astrologers from beginners to recognised experts. The subjects were the same as those in the previous summary, but excluded 128 who did not have the required combination of extreme E and N. That is, each extreme (E+, E–, N+, N–) had 40 subjects, total 160, of which 40 were E only, 40 were N only, and 80 were both E and N. Therefore each astrologer had to make a total of 240 judgements. The mean score of the (+)

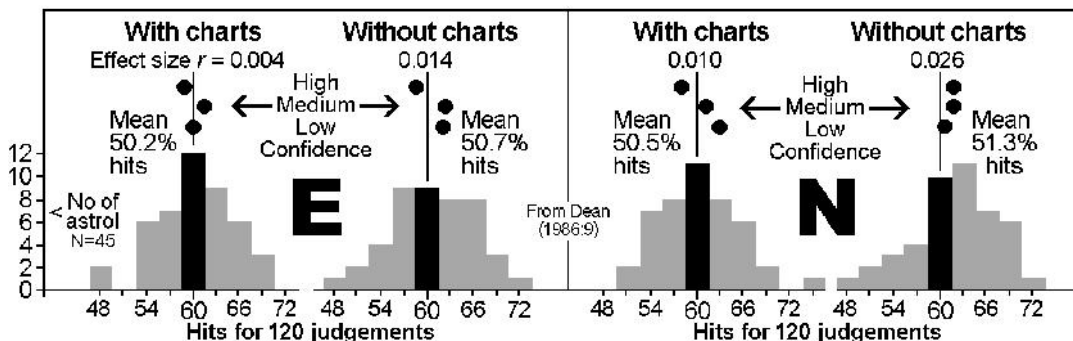
extremes was typically seven standard deviations from the mean score of the (–) extremes, so in each case the direction (+ or –) was exceptionally clear-cut.

Mean age of the subjects was 30 (range 15-66), 46% were university students, and 72% were female. All had recorded birth times usually to better than half an hour. Allowing 5 minutes per judgement, the test required a whole week of evenings to complete and was thus the largest that astrologers were likely to tolerate. All charts were computer calculated by Neil Michelsen's ACS without charge in the style preferred by each astrologer with a choice of several house systems, midpoints, asteroids, and Hindu sidereal plus navamsa (9th harmonic). A set of 160 one-page charts (two-page if midpoints or navamsa were included) was 15 mm thick and 0.8 kg in weight. Each chart included the sex and full birth data of the subject.

During 1981 participation was invited via notices in astrology journals in the UK, USA, Europe, Australia and New Zealand, and probably reached about 10,000 astrologers. In response to each enquiry a flyer was sent out containing most of the covering notes and an example chart, followed by a complete test set if the astrologer decided to go ahead (and about 2 in 3 did). When finished, the astrologer returned the charts for re-use together with the completed judgement sheets. Enquiries and chart mailings were handled without charge by Zip Dobyns in the USA. Charles Harvey and Patrick Curry (UK) and Peter Niehenke (Germany) helped to distribute information and chart sets. A special German edition was prepared by Peter Niehenke. Owing to the large amount of time required to complete 240 judgements, and the need to recycle charts to conserve funds, it took four years to obtain 45 responses. Country of origin was: USA 17, UK 12, Australia 8, Europe 7, Japan 1. This compares favourably with the replication by *Astrology Now* magazine of Vernon Clark's second test, which involved only ten judgements and attracted 49 responses. For control purposes a set of judgement sheets excluding the questionnaires were completed by another 45 astrologers but without using charts, ie by simply guessing. Which, unlike a purely chance expectancy, allows for artifacts such as response bias and sampling errors. The time taken for all 240 control judgements was typically about 20 minutes. Country of origin for the controls was: USA 13, UK 5, Australia 23, other 4 (all this is mostly unabridged from p.7).

Accompanying each set of charts was (1) a score sheet indicating for each chart the judgement required (E or N or both), with space for the actual judgement (+ or –) and the confidence with which it was made (high, medium, low). (2) Detailed meanings of E and N. (3) A copy of the Eysenck Personality Questionnaire for completion and return. (4) A questionnaire asking for details of age, gender, experience, technique, use of intuition, time taken, test fairness, and general comments. Each astrologer had to judge the direction (high+ or low –) of E and N as per the score sheet, and indicate how confident they were in each judgement. So each judgement could be qualified in the same way as in everyday practice. The result was 5400 judgements of E and 5400 judgements of N, plus the same for E and N control judgements.

Hit rate. On average each astrologer had 10 years of experience (range 1-36 years), spent nearly 5 minutes on each judgement (range 0.5-15), and were generally confident of success (only 21% of judgements were made with low confidence). But the effect sizes were at chance level and in the wrong direction, with mean observed r of 0.007 with charts vs 0.020 without charts. In terms of a client consultation, 0.007 equates to getting one chart judgement correct in every $2/0.007 = 300$ chart judgements that are no better than tossing a coin (see 8.2.4):



Dots above each plot indicate the equivalent hit rate for judgements made with high, medium and low confidence. If anything the judgements were made worse by looking at birth charts. The hit rate (black dots) should improve as confidence increases from bottom to top. But the hit rates are negligible (chance 50%) with no consistent trend.

In terms of effect size, factors potentially affecting judgement such as technique, experience, personality, gender, use of intuition, time spent, and birth data accuracy made no significant difference. Experienced experts were not consistently better than beginners. For comparison the effect size for simplistic actuarial judgements based on the general slight decrease in E and N with increasing age (where the rule was "if age is over 35 years then E- and N-, otherwise E+ and N+") was 0.14, hardly useful but still notably better than astrology.

Agreement. For something said to be readily discernible in charts, see 7.6.1986.3, we might expect astrologers to agree on their judgements, in this case whether E and N were + or -, and on their confidence in a given judgement. Especially as each astrologer had complete freedom to take into account all relevant factors ranging from birth time uncertainty to uncertainties in interpretation. But for both E and N the agreement among astrologers was very poor, whether judging + or - (mean r 0.10), and their confidence (mean r 0.01), even though judging + or - is much easier than judging positions on a continuum.

Confidence. If we have a genuine judgement skill, psychic or non-psychic, our accuracy should increase as our experience-based confidence increases. But judgements made with high confidence were no better than those made with low confidence. Again, factors such as technique, experience, personality, gender, use of intuition, time spent, and birth data accuracy made no difference. Experienced experts were not consistently better than beginners. The fairness of the test was supported by the high proportion of judgements made with high confidence (34%) and medium confidence (45%), with only 21% being made with low confidence. But confidence made no difference. All effect sizes were negligible:

Rated confidence	Mean number of judgements	Effect size r for hits Is the subject extreme (+) or (-)?	
		Extraversion	Neuroticism
Low	1125	0.00	0.05
Medium	2430	0.03	0.02
High	1845	-0.02	-0.04
Mean agreement on confidence		0.02	0.00

Last line above. The mean agreement on confidence is negligible, less even than the negligible mean agreement on judgements (where r was 0.16 for E and 0.04 for N). This is decisive because tests of agreement and confidence overcome any arguments about the validity of E and N for testing astrologers. Even if E and N were meaningless, this is of no consequence provided E and N are held to be discernible in birth charts – and the astrologers would hardly have proceeded if it were otherwise. We might conceivably explain away poor effect sizes for hits, but not poor agreement or the inconsequence of confidence.

That is, no matter how easy or hard the judgement might be, we might expect at least some agreement on how easy or hard it is, and thus some agreement on how confident the judgement should be. But there is effectively no agreement. When variables as basic as E and N produce negligible hit rates and agreement for subjects known to be extreme, it implies there can be no hope for more complex variables such as those that fill astrology books.

Intuition. Often said to be essential. But the reported use of intuition had no effect:

Reported use of intuition	Number of astrologers	Effect size for hits and agreement Is the subject extreme (+) or (-)?			
		Extraversion		Neuroticism	
None	9	-0.00	0.12	0.02	0.04
Hardly any	16	0.01	0.17	0.03	0.05
Some	13	-0.01	0.17	-0.01	0.02
Lots	5	0.02	0.17	0.01	0.00
r 1st vs 2nd half hits	45	-0.13	----	0.02	----

The first figure in each pair is the mean effect size for hits, second figure is the mean agreement between astrologers. All are negligible. The agreement is slightly better for E in keeping

with its higher rated discernibility (see 7.6.1986.3), but that is all. In the last line, contrary to what the use of intuition might predict, astrologers getting high scores for the first half of their judgements showed no tendency to get high scores for the second half of their judgements. With or without intuition, these astrologers could not tell one extreme from another.

Of course the reported use of intuition (or what the astrologers saw as intuition) does not mean that intuition or psychic ability was genuinely present. Nevertheless a genuine presence might be most likely where judgements show good agreement. But when the judgements were ranked by agreement for E hits, the effect sizes for the best and worst thirds were essentially no different (0.01 vs -0.01). The results for N hits were no better. Of course if astrology (or anything) is false, it cannot provide data for unconscious processing, so any success would by definition be due to psychic ability rather than intuition. But there is no success.

Astrologer variables. Responses to the questionnaires were available for 41 of the 45 astrologers vs the corresponding ENP score. Those reporting use of intuition tended to be N+ ($r = 0.33$, $p = 0.04$) and P+ ($r = 0.31$, $p = 0.05$) but not especially E+ ($r = 0.02$), whereas r 's of 0.15-0.20 are typically reported between E+ and apparent ESP performance:

See Jessica Utts. Replication and Meta-Analysis in Parapsychology, *Statistical Science*, 6, 363-403, 1991:376-377.

Comparison of astrologer ENP scores with other variables occasionally revealed correlations of up to $r = \pm 0.3$. But among so many comparisons their true significance was hard to judge and numbers were too small for a valid replication. For example, confidence tended as predicted to increase if the test was perceived to be easy ($r = 0.31$, $p = 0.05$) but tended to decrease as experience increased ($r = -0.32$). The correlation between time taken and perceived difficulty was surprisingly low ($r = 0.29$). In accordance with previous gender findings, see Eysenck and Eysenck (1985) cited above, the 26 female astrologers tended to be more N+ ($r = 0.25$) and more P- ($r = 0.14$) than the 15 male astrologers. They also reported using more intuition, albeit only slightly ($r = 0.12$). But in terms of the mean r effect size for hits, females (0.01) hardly differed from males (-0.00). There was no significant tendency for E+ astrologers to favour E+ judgements ($r = -0.14$, $p = 0.38$), but there was a marginal tendency for N+ astrologers to favour N+ judgements ($r = 0.23$, $p = 0.15$).

Subject variables. It made no difference what sex the subject was, how old they were, how extreme they were, or how exact their birth time and place were. The astrologers scored at chance level regardless. When premium subjects (ie excluding those with inexact birthplaces and birth times to the hour or half hour) were judged by the 13 most experienced astrologers (average 18 years of experience, range 11-36), the result was 806 judgements with an average hit rate of 51.5%, which is not significantly better than before.

Technique. In decreasing order of popularity the factors used were major aspects (used by all), ascendant, signs, angularity, houses, element, minor aspects, hemisphere emphasis (used by 50%), quality, rulerships, polarity, midpoints (used by 30%), Jones shapings, asteroids, and retrogradation (used by 10%). Few of the 45 astrologers used unusual factors such as the Vertex, hypothetical planets, helio positions, harmonics, distance and framing, and even then they usually ranked them low in importance. The average number of factors used was 9, range 2 (aspects and angularity) to 14. Yes, some techniques are claimed to work better than others, but there is no agreement on which ones. The present results suggest a good reason why there is no agreement on which techniques work best, namely none of them work.

Was the test fair? The response was yes 24, no 7, no reply 10. "No" answers mostly blamed the lack of information on upbringing and environment (which for such extreme subjects was largely irrelevant), and the absence of personal contact with each subject (which of course would have revealed the answers directly). There were no suggestions for improvement.

But what if astrology works only for some people? Judgements of the 80 subjects who were extreme on both E and N showed negligible correlation between E hits and N hits (r

= 0.02), which correlation should be appreciable if astrology worked only for some people, but not if astrology did not work at all. By contrast, the correlation between E confidence and N confidence was extremely significant ($r = 0.34$, $p = 10^{-90}$), and persisted even when birth charts were not used ($r = 0.27$, $p = 10^{-55}$), clearly suggesting that it was more a product of the astrologers' imagination than of anything actually in the birth chart.

7.6.1985.3 Birth charts of 68 terrorists disconfirm hypotheses

Luigi Squitieri, *APP* 3(2), 16-21, 1985.

Definite statistical conclusions can hardly be drawn from a study of 68 cases only. But the author's clear starting hypotheses (eg low frequency of Cancer and 4th house, high frequency of 11th and 12th houses, angular Mars, Uranus and Neptune) are so strongly contradicted by the outcomes that more cases would probably not change anything. Conclusion: tradition is not confirmed in the case of terrorism. His report includes birth data. See also 7.6.1986.4.

7.6.1985.4 Is MA-180-JU really as bad as Charles Carter claims?

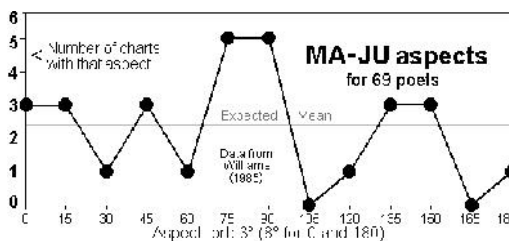
L A Williams. Mars-Jupiter aspects in charts of notable writers. *Journal of Research of the AFA* 2(2), 35-47, 1985.

In his 1930 book *The Astrological Aspects* (revised 1967) Charles Carter, the leading UK astrologer of his time, gives his conclusions based on two or three dozen examples of each planetary aspect. Of all possible aspects he finds that an inharmonious Mars-Jupiter aspect is the worst, especially 180° , for its extremism and inability to follow the path of moderation. He noted in a footnote a tendency for it to be linked with the stage and with dramatists (p.124).

Which attracted the attention of the author, who had MA-180-JU, as did his wife (orbs not stated), and both were writers, in his case for the stage and radio. So he looked at MA-JU aspects in the charts of 60 playwrights, 69 poets, 172 novelists, 212 playwrights, and others. There was no consistent emphasis on MA-180-JU, but when he plotted frequency as a percentage of the expected average against aspect, the result was a provocative series of peaks.

He calculated the expected average via the aspect arc, ie as sample size $\times$ (arc $^\circ$ occupied by aspect)/ 360° , which is not strictly valid due to the non-uniformity of planetary motion, but any errors in the present context are not important.

He concluded that there was a relationship between MA-JU aspects and writing success, with some aspects showing up "much more often than average", and others being "conspicuous by their relative scarcity" (p.35), which suggests that aspects generally "can be a fruitful field for further enquiry" such as Saturn aspects in the charts of "self-made men and women" (p.46).



Comment When the author plotted his results as percentages he effectively concealed the variations caused by his small samples. Thus when his 69 poets are re-plotted as number of charts, not as percentages, the source of his supposedly provocative peaks (ie sampling variations) becomes obvious. The statistics no longer lie.

The author's seemingly provocative peaks for 69 poets are typical of his samples. When plotted as percentages of the total count the result looks much the same but there is no indication of sample size so the plot is misleading.

7.6.1985.5 A computer study of 251 relationships

Gail Guttman, *Kosmos* 14(2), 2-8, 1985.

Relationship astrology was tested on 106 long-term couples (>10 years) and 145 short-term couples (<10 years) by a computer program that tallied 17 planets and asteroids, 4 angles (Ascendant, MC, Anti-vertex, East Point), and 16 aspects (all multiples of 30° or 45° , orb 1° – 3°), a total of 3360 factors. The same couples were mixed and rematched to form a control group. In decreasing order of statistical significance the top seven male-female contacts for the long-term couples were Moon-Moon's mean south node, East Point-Ascendant, Chiron-Saturn,

Moon-Moon's true north node, Pluto-MC, Ascendant-Pluto, and Ascendant-Juno. For the short-term couples they were Moon's mean south node-Uranus, Pluto-Chiron, MC-Mars, Ceres-Vesta, Jupiter-Antivertex, Chiron-Pluto, and Neptune-East Point. Of the top 15 contacts none replicated between the two groups, and traditional contacts such as Sun-Moon and Venus-Mars were absent. Obviously there is much that needs further study.

Comment The logic of this test is unclear. Since none of the top 15 (and somewhat bizarre) contacts replicated, and none were predicted in advance of testing, the results provide no evidence for astrological effects in relationships. All that can be concluded is that in any ranked list of contacts, even if picked at random, some contacts must necessarily come top.

7.6.1985.6 Hot and cold astrology. But does it replicate?

David Black, An astrological study of sexually abused women. *Matrix Monograph #16*, 19pp 1985 (written in 1981).

Black's subjects were twenty women who had suffered repeated rapes and batterings. They were all born in the same hospital, and their birth data were from its records. He comments:

Shortly after beginning this study, I formed the expectation that its subjects would have an unusual number of aspects between Venus and Pluto, especially afflictions. This expectation was based on the fact that Venus is the most strongly feminine of all the planets, and that what happened to the women was highly related to their sex; and on the fact that Pluto is the planet most strongly identified with nasty violence, oppression, and imposition of will (p.4).

His expectation seemed to be confirmed when he found the following apparently significant factors in their birth charts: Venus-Pluto aspects, Venus in Earth signs, Venus in the eastern hemisphere other than near the Ascendant, Moon absent from Pisces through Gemini. The first ten charts showed the most striking results ($p = 0.02$); the second ten were less dramatic ($p > 0.1$). Black feels this was because the first ten charts were enthusiastically calculated by hand, whereas the second ten were less enthusiastically calculated by computer, so the results "seem to have been fed by our enthusiasm" (p.10). Or as Michael Erlewine later put it, "the cases that we are drawn to when pursuing astrological insight may be hot when we are hot and cold when we are cold" (*ACT Newsletter #1:1*).

Comment No hot-cold hypothesis is needed to explain Black's results. Aspects, sign and house positions alone provide over 200 different chart factors. So in any set of charts at least $0.02 \times 200 = 4$ factors will appear to be significant at the $p = 0.02$ level by chance alone. But because only chance is responsible, they rarely replicate. So what Black observed is precisely what we should expect if nothing special is happening.

But do the results replicate? In 1978 US astrologer T Patrick Davis published *Sexual Assaults: Pre-identifying those vulnerable*, a detailed study of 30 victims. When females under ten years old and males are excluded, the total is 20 timed charts, the same as in Black's study. The important point is that these charts were collected by an enthusiastic astrologer, not by a cold critic, so according to the hot-cold hypothesis they should replicate his findings. But the chart factors that Black found to be so extraordinary are quite normal in Davis's charts:

Significant chart factor according to Black	Observed frequency (20 charts each)		Expected frequency (approx)
	Black	Davis	
Major aspects orb = 3° of Venus-Pluto (ie 0,60,90,120,180°)	8	2	2.5
	12	3	5
	14	9	8
	17	11	10.5
Venus in Earth signs	10	3	5
Venus in E hemisphere	14	11	10
Venus-0-Ascendant orb 15°	0	4	2
Moon in PI through GE	0	5	6.5

So Black's results do not replicate, and the hot-cold hypothesis is not supported. Furthermore, as interpreted by leading US astrologers Hand, Lundsted, March & McEvers, Pelletier and

others, Venus-Pluto signifies intense love feelings, which would seem to be the last thing that a rape victim experiences. Nevertheless, is the frequency of Black's rape factors realistic?

US Department of Justice figures suggest that the chance of a female living in the US being raped in her lifetime is between 1% and 10% depending on location, the national average being about 5%. The average for repeated rape as suffered by Black's subjects is probably about 1%. By contrast the probability of any chart having Black's Venus-Pluto factors is about 40%. So they are not realistic (1% vs 40%). Using these factors to predict your client will suffer repeated rape in her lifetime means you will be wrong 39 times out of 40. There is also the problem that unless you can see sex in a chart you will have even less chance of success.

7.6.1986.1 Can subjects pick their own chart reading?

NZ Marbell, AR Novak, LW Heal, LD Fleming, JM Burton, *NCGR Journal* Winter 1986-87 pages 29-43. This study was unusual in that: (1) The authors included two PhDs (Novak, Heal), two consultant astrologers (Marbell, Burton), and an expert in research design (Fleming), all of the Madison (Wisconsin) based Synapse Foundation of which Marbell, now deceased, was the executive director. (2) It was endorsed in writing by two major astrological organizations (ISAR, NCGR) and two prominent astrologers (Omarr, Dobyns). (3) Three prominent skeptics/scientists (Abell, Kurtz, Kanouise) provided written support for a funding application to the National Science Foundation. (4) The National Science Foundation unusually invited resubmission of the application after improvement. Eventually the study was funded by Synapse, by the experimenters, and by personal contributions. (5) *AFAN Newsletter* April 1992 reprinted a report "Results of study back astrology" from the Madison *Capital Times* 5 November 1981, which wrongly described the study itself as the "first ever to scientifically study astrological personality theory" (pp.4,10).

The authors begin by promoting their study as part of a grand vision for humanity:

The great value of a validated astrology is as an amazingly useful tool for understanding our human species. Beyond even the great practical potential is the significant intellectual consideration. A proven astrology links the two primary intellectual pursuits of humankind, the physical sciences and the life sciences, into a unified stream (p.30).

Their study involved three tests. Subjects were 24 female office workers aged 31-55 who had volunteered to take a "personality test". Individual astrologers prepared a two-page chart reading for each subject with up to 17 sections, each reflecting a particular chart factor such as Ascending sign, Sun sign, Moon sign, closest square, individual houses 1-12, Moon's south and north nodes. Each reading was revised by a committee of five astrologers to ensure consensus and uniformity of content. All chart work was performed blind.

Each subject was given three readings (one genuine and two controls) and had to mark each section yes, no, or uncertain. Finally they had to pick the reading that fitted them best. Picking the correct reading counted as a hit. Tests 2 and 3 were made by post. Here are the results:

Test	Subjects	Hits	Expected	Binomial p
1	6	6	2	0.0014
2	9	4	3	0.35
3	9	4	3	0.35

The authors noted that the hits in each test exceeded expectancy, and concluded "astrological interpretation of personality is thus supported" (p.36). For astrologers it was good news.

Comment Replicability across tests is too poor, and sample sizes are too small, to give convincing results. The three tests varied in the complexity of the astrology being tested, but each included a sun sign delineation that, like each of the factors being tested, was isolated in its own section and not synthesized into an overall reading. But there was no control of sun sign self-attribution and no reference to it in the authors' text or references, probably because (from the supporting letters all dated between 1976 and early 1979) the tests were designed before the importance of self-attribution became widely known. In other words self-attribution is a more plausible explanation for the results than is astrology.

The plausibility of self-attribution is supported by: (1) One of the subjects in Test 1 was later found to have supplied the wrong birth time, which would have made a difference to much of the reading albeit not the sun sign, yet the subject still picked the correct reading. (2) The

subjects (middle-aged female office workers) were precisely the kind likely to read women's magazines and therefore to be familiar with their own sun sign meanings. (3) The hits for each chart were consistently higher for the sun sign than for any other factor (p.33).

Test 3 was described as a test of biorhythms to (invalidly) control for knowledge of astrology. Three subjects in Test 2 had to be repeatedly reminded to return their responses, and five subjects in Test 3 mixed their responses in with their regular office work. The authors saw this as sufficient to disqualify these subjects, which slightly improved the results, but there was still no convincing evidence of replicability, the *p*'s for Tests 1, 2, 3 being 0.0041, 0.10, 0.11. The study shows how even the best experts and the best endorsements are of no consequence if the research design is inadequate. But it did lead to the Carlson study, see next.

7.6.1986.2 Shawn Carlson's double-blind test of astrology

Françoise Gauquelin, *APP* 4(1), 4-8, 1986. Followed by a critique from Hans Eysenck and Teresa Weed Hamilton.

The original study by Shawn Carlson appeared in *Nature* 318, 419-425, 1985 at which time it was the largest study of its kind. It was notable for involving (1) an advisory panel of three prominent NCGR astrologers to ensure the study was fair, and (2) double-blind conditions to avoid any possibility of bias. Despite which it generated huge controversy among astrologers. So this summary is a long one. It includes information kindly provided by Carlson in 1986 that is not in the original *APP* article. The study involved three different tests as follows:

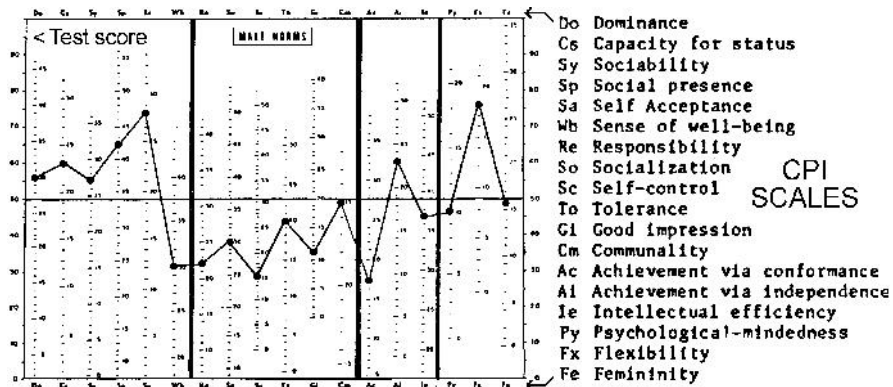
(1) 128 subjects had to pick their own chart interpretation out of three. Subjects were obtained via advertisements and notices in the San Francisco Bay area, and excluded anyone who strongly disbelieved in astrology, or had previously had a chart constructed, or were under 17. Roughly half were male. About 70% were college students, of which about half were graduates. Mean age was 28, range 17–65. If their birth data were not documented and if their birth time was not recorded to better than 15 minutes, they could not be test subjects but could be controls, see below. Charts were calculated by two astrologers using a Digicomp DR70, a chart-calculating computer marketed in the 1970s before PCs became available, and the interpretations were individually typed by a total of 28 experienced astrologers chosen by the advisory panel for competence and a background in psychology. Each interpretation was about 1000 words on pages supplied by Carlson with printed headings typical of chart readings (eg personality, relationships, career, education, current situation) to ensure uniformity of content and length. So each interpretation represented the best US professional practice. To avoid giveaway clues, each avoided astrological terms and age indications. As a check on giveaway clues, 128 control subjects (same sun sign as the actual subjects, differing in age by at least 3 years, chosen at random) were given the same task. Usable responses were received from 83 subjects and 94 controls. The rankings of the authentic interpretation were as follows:

	Observed hits in			Expected	Binomial <i>p</i> of	<i>r</i> effect size
	1st	2nd	3rd place	hits	hits in 1st place	√(chi ² /N)
83 subjects	28	33	22	83/3 = 27.67	0.51	0.008
94 controls	42	34	18	94/3 = 31.33	0.014	0.241

As shown in the second-last column, the rankings in 1st place by subjects did not differ significantly from chance. However, inspection showed that most subjects did not rate each part of the interpretation independently of the rest, so it was not possible to evaluate each topic (eg personality vs relationships) as had been intended. The significant result for controls suggested the presence of giveaway sun sign clues, but why did test subjects not show a similar effect? It did not affect the outcome and was seen as a statistical fluctuation (p.423).

(2) To see whether subjects could recognise themselves in a personality description, they had to rate on a scale of 1 (worst) to 10 (best) the accuracy of three profiles generated by the California Psychological Inventory, which at the time was among the best inventories available. It was chosen because its validity had been extensively researched, and because its scales

(then based on popular concepts of personality rather than concepts established by tests) were judged by the advisory panel to be closest to what could be seen in a chart. One profile was the authentic profile, the other two were chosen at random from subjects of the same sex. The subjects also received an explanation of CPI scales and how to make a selection.



Left: A typical CPI profile. From Carlson's paper in *Nature*.

left-right = traits
vertical = scores
joined by zigzag

Right: The scale names, enlarged here for clarity, are abbreviated at the top and bottom of each profile.

As a check on giveaway clues, the same material was given to control subjects (same sun sign as the actual subjects, and same sex because some CPI scales discriminate between the sexes). Altogether the CPI has 18 scales, three of which (well-being, good impression, communality) are to detect faking. The rest provide scores on traits such as sociability and self-control.

Unfortunately the CPI test encountered problems. The subjects were interested in astrology, not in testing the CPI. They had not been advised of this new test, and it involved assessing unfamiliar zigzag profiles (see above example) rather than words. To busy people it was unwelcome. Unsurprisingly, more than half the subjects failed to respond. The subjects who did respond ranked the authentic profile as follows:

	Observed frequency in			Expected	p of frequency
	1st	2nd	3rd place	frequency	in 1st place
56 test subjects	25	16	15	56/3 = 18.67	0.07
50 control subjects	21	13	16	50/3 = 16.67	0.19

Both results were in the right direction (with more in the right direction than when ranking authentic charts) and for the test subjects it was marginally significant. Given that most people are close to average and not extreme, the three profiles would generally be quite similar. So the result is unsurprising.

(3) For each of the charts they had interpreted plus a further chart, each astrologer was given three CPI profiles. One was the authentic profile for the chart subject, the other two were chosen at random from other subjects of the same sex. Each astrologer also received a copy of the CPI manual that explained the meaning and interpretation of each of the 18 CPI scales. They then rated the fit between each chart and its three profiles on the same 1–10 scale.

Because all astrologers had some background in psychology (nearly all claimed to have some formal training in psychology, average three years, three were professional psychologists, and most claimed to have some experience of the CPI), this test should have been easier for them than it was for the subjects. Nevertheless, of the 226 sets sent out, only 114 complete sets (and two incomplete sets) were returned. The results were as follows:

	Profile was in			Binomial p (Exp=N/3)	r effect size
	1st	2nd	3rd place	for hits in 1st place	$\sqrt{(\chi^2/N)}$
Hits	40	46	28	.43 if N=116	0.024
Charts	116	114	114	.38 if N=114	0.037

Again the results were in the right direction but were not even marginally significant.

The NCGR advisory panel predicted that in both test 1 (pick own chart interpretation out of 3)

and test 3 (match chart to CPI profile out of 3), the hit rates would be about 50% rather than the 33.3% expected by chance. But the observed hit rates were 33.7% and 34.5%. So although the panel was satisfied that the tests were fair, and the results were in the right direction, the results were more or less at chance level (and still less than the $25/56 = 44.6\%$ hit rate for subjects picking their own CPI profile).

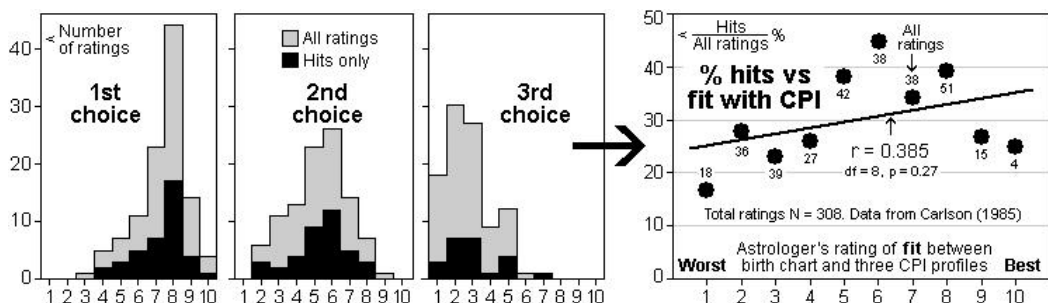
Carlson saw that the inability to recognize their own CPI profile was problematic, therefore "we cannot use the result to rule against [astrology]" (p.424). Nevertheless the failure to meet the panel's predicted levels of success makes a "strong case against natal astrology as practiced by reputable astrologers" (p.425).

Critiques by Professor Hans Eysenck and US astrologer Teresa Weed Hamilton focused on the CPI. Despite its popularity, most of the validity coefficients for single scales are low, while collectively the scales are both too complex and too limited to be a good test of astrology. Its acceptance by the advisory panel of astrologers suggests they had little training in psychology. So they concluded that Carlson's study is not a valid test of astrology.

Comment 1 They overlooked the first test, which did not involve the CPI and thus remains valid, especially as the interpretations were prepared and individually typed by reputable astrologers as recommended in the days before computers. The ability to pick one's own CPI profile was explored by RL Greene et al, *Journal of Personality Assessment* 43, 419-423, 1979, who gave 119 students their actual and inverted CPI profiles (a difference generally larger than between actual profiles) and found that 69% chose the actual profile versus 50% expected by chance. S Word, *Journal of Personality Assessment* 66, 402-413, 1996, asked 64 students and 64 close friends to pick the student's actual CPI profile out of three. 55% of students chose the actual profile versus 33% expected by chance ($p = 0.0002$), as did 45% of their close friends ($p = 0.06$). So it can be done. CJ Soto and OP John (*Journal of Research in Personality* 43, 25-38, 2008) found by factor analysing a total of 1349 CPI responses that they reduced to 5 dimensions (mean reliability 0.84) with a mean correlation of 0.72 with Big Five scales, "a testament to the breadth and depth of the CPI" (and thus its sound foundations).

Comment 2 In *Correlation* 27(2), 7-33, 2011, British astrologer Robert Currey cites Ertel's re-analysis in *Journal of Scientific Exploration* 23(2), 125-137, 2009, which points out:

(1) The percentage of hits tends to increase as the 1-10 rating increases, as below right::



Left: Of the astrologers who responded, few mentioned having difficulty in assessing profiles. Notice how the ratings for 1st choices tend to be higher than for 2nd choices, which in turn tend to be higher than for 3rd choices. This trend suggests that the difference between choices was reasonably clear. **Right:** The percentage of hits tends to increase as the fit improves from 1 to 10 ($r = 0.385$), but it is not even weakly significant ($p = 0.27$).

Ertel also analysed the above increase in percentage of hits by rating the choices as +1 (hit) or -1 (miss) and then calculating the (nonparametric) correlation as Kendall's *tau* between rating values (1-10) and hit/miss values (+1 and -1). For example, in the "3rd choice" box, rating value 1 on the horizontal scale has 3 hits and $18-3=15$ misses. For the total of 306 choices (1st, 2nd and 3rd), the value of *tau* was 0.088, for which one-tailed $p = 0.037$ (nominally significant, whereas two-tailed $p = 0.074$ nominally nonsignificant).

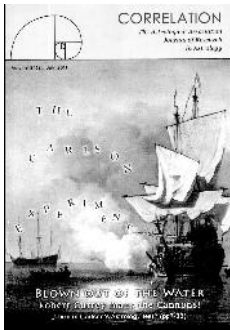
(2) The total of 40+46 for 1st and 2nd CPI choices is nearly significant (binomial $p = 0.054$). This result could be interesting except that no astrologer claims to give a reading that automatically applies to an unknown future client as well as the client who is receiving it. Ertel also points out that picking the best fit from 2 choices is an easier test than picking from 3. But astrologer Herman De Vos (7.7.1975.1) might disagree about 2 being easier than 3.

(3) Carlson's sample size was insufficient to detect small effect sizes. But this is hardly a flaw when it was sufficient to detect the predicted effect sizes. Ertel also complains that Carlson's first study (can subjects pick their own chart reading?) should have compared subject versus control hits in a 2 x 2 table but didn't. But inexplicably Ertel does not make this particular comparison, so here it is:

1st choice	Hits	Misses		1st+2nd choices	Hits	Misses
Subjects	28	55			61	22
Controls	42	52	$p.18$	+	76	18 $p.32$

In each case subjects do not perform significantly differently from controls. So Ertel's preferred 2 x 2 test makes no difference to the outcome. Finally Ertel concluded that his results were:

insufficient to deem astrology as empirically verified but they are sufficient to regard Carlson's negative verdict on astrology as untenable (p.125) [for "astrology" read "matching astrology to CPI profiles"]



But contrary to Ertel's modest conclusion, Currey asserts that "the Carlson test has yielded powerful evidence for astrology" (p.17), where "top astrologers ... successfully performed to a level that cannot be dismissed as chance" (p.19), while *Correlation's* cover asserts that Carlson's study has been "blown out of the water". Both ignore Carlson's first test, which did not involve the CPI and thus remains valid. Furthermore, a modest p value in astrology or any other area is never powerful evidence for anything. It suggests only that the experiment is worth repeating, see 7.7.2016.3. In science no conclusions are accepted unless the result on which they depend can be independently replicated.

As it happens US psychologists Wyman and Vyse (*Journal of General Psychology* 135(3), 287-300, 2008) made a near-replication using the NEO (Big Five) personality inventory. They asked 52 college students aged 18-22 to pick their own NEO five-factor profile out of two, their own *Solar Fire* v5.0.19 computer-generated chart reading out of two, and rate them for accuracy on a scale of 1–7. The chart readings were based on the ascending sign, the signs and houses of Sun through Saturn, and the houses of Uranus through Pluto. Giveaway cues such as sign names and house names had been removed. Aspects were excluded because their number (which varied with subject) would have given authentic and control readings of non-uniform lengths. The students could pick their own NEO profile (79% hits vs 50% expected by chance, $p = 0.00003$) but not their own chart reading (46% hits vs 50% expected by chance, $p = 0.58$). Both the control NEO profiles (mean rating 6.1) and the control chart readings (mean 6.5) were significantly more positive than neutral (5.0), thus showing evidence for social desirability. Students who knew their sun sign meanings ($N=34$) rated the sun sign statements significantly higher than students ignorant of their sun sign meanings ($N=15$).

Comment 3 See also 7.6.2006.2. *Solar Fire* is generally recognised as the leading software for professional astrologers. The study was limited in its sample size, age of subjects, and its choice of chart factors, and it did not attempt a chart synthesis that was a feature of the Carlson study. Nevertheless the subjects' self-awareness was sufficient to validate NEO profiles but not computerised astrology profiles, which is consistent with Carlson's result but not with the confidence in astrology held by astrologers, see 4.1.3. See also the tests of profiles in 7.1.1974.6, 7.6.1975.1, 7.6.1978.1, 7.6.1981.2, and 7.6.2006.1. But the astrologers' reaction to the Carlson study is all too typical given their blind eye for other tests, see 8.10.1.

7.6.1986.3 Discernibility of E and N in charts

Geoffrey Dean, *Correlation* 6(2), 7-52, 1986. A discussion and follow-up to 7.6.1985.1 and 7.6.1985.2 with 110 references. This summary is of the part that looks at the perceived discernibility of characteristics in the natal chart.

Astrologers at conferences in the UK and Australia during 1985 and 1986 were asked to rate on a scale of 4 (from 1 easy to 4 impossible) how easy it was to see various external realities in the natal chart. The average of 86 responses (67% female) showed reasonable agreement:

- 1.0 EASY
- 1.6 **Extraversion** (impulsive 1.3, sociable 1.5, extraverted 1.9, easygoing 1.9)
- 1.8 **Relationships** (power struggle 1.7, physically attracted 1.8, get on 1.9)
- 1.9 **Psychoticism** (unconventional 1.9, domineering 1.9)
- 2.0 MEDIUM
- 2.1 **Neuroticism** (easily upset 1.7, prone to worry 2.0, stress 2.3, traumas 2.4)
- 2.4 **Ability** (good at art 2.1, science 2.4, music 2.4, astrology 2.6)
- 2.8 **Intelligence**
- 3.0 DIFFICULT
- 3.0 **Relationships** (fall in love)
- 3.3 **Propensity** (to suicide 3.2, homosexuality 3.3, murder 3.4)
- 3.5 **Appearance** (bulk 3.4, height 3.5)
- 4.0 IMPOSSIBLE

Most of the above characteristics were presented as polar opposites like controlled-impulsive, tall-short. The standard deviation of an average rating was typically 0.8, and a difference of 0.2 or 0.3 was significant at the $p = 0.10$ or 0.01 level. There was good agreement between the mean ratings for UK and Australian astrologers ($r = 0.93$, $p = 10^{-8}$, $df = 22$), and fair agreement between their individual ratings ($r = 0.47$, $p = 0.02$, $df = 22$). Average experience was 7 years, range 1-30. Compared with inexperienced astrologers, experienced astrologers rated the characteristics as less difficult, typically by 0.1 to 0.2. Male astrologers were slightly more conservative than the female astrologers.

On average the astrologers felt that extraversion, relationships, psychoticism, and neuroticism should be fairly easy to see in charts, which means that tests involving these characteristics (if reliably measured) should be unproblematic. As percentages, on average the 86 astrologers felt that about 22% of people fit their birth chart in every possible respect (so $r = 1.00$), 57% fit their birth chart in most things ($r = 0.7$ say), 18% fit their birth chart in a few things only ($r = 0.3$ say), and 3% fit their birth chart in almost nothing ($r = 0.1$ say). Here the average fit is equivalent to about $r = 0.68$, about the same as between adult height and weight.

Comment Evidence for the validity of E extraversion (sociable-reserved) and N neuroticism (worrying-calm) scores established by personality test is overwhelming (Eysenck and Eysenck, *Personality and Individual Differences* 1985, over 1200 references). It is a mistake to see E and N as merely two traits among many. They may be only two but they are the Big Two. To discover their richness try adding another dimension such as intelligence. The intelligent E+N+ may present a glitter of sparkling sociability overlying undesirable carelessness and overreaction, whereas the dull E+N+ is likely to be immature and antisocial.

Unfortunately a common mistake is to confound N+ shyness (anxious, insecure, scared of others) with E- shyness (quiet, prefers own company, distaste of others). Thus conditions of high stress, such as being under critical attention, will induce high anxiety in the E+N+ person, causing them to withdraw and appear anything but E+, whereas the E-N- person will be unaffected causing them to appear more E+ than they really are. The distinction is easily made by introspection, and therefore by questionnaire, but is not obvious to observers, and is a major source of error even among experienced observers.

JH White et al, *British Journal of Psychiatry* 114, 63-68, 1968 have shown the predictive power of E extremes on their own. In 1965 the 6 most extreme extraverts ($E \geq 19$ on a scale of 0-24) and the 9 most extreme introverts ($E \leq 3$ ditto) were selected from the first-year male intake to the fully residential University of Keele, which represented the top 3% and the bottom 4% of

N=236. Mean age was 19 years. Compared to the introverts, the extraverts had attended more dances (0.83 vs 0.40), more parties (4.0 vs 0.6), and more bars and snack bars (8.8 vs 4.3 per week). They had more friends at university (7.0 vs 4.8), missed more lectures per week (4.2 vs 1.9), read fewer books per week (2.0 vs 2.6), gatecrashed more parties (0.8 vs 0.0), and spent more weekends away from university (4.0 vs 1.3). Now the females. The 27 most extreme extraverts ($E \geq 15$) and the 26 most extreme introverts ($E \leq 6$) were selected from the first-year female intake of N=164, which represented the top and bottom sixths. Three times as many extraverts as introverts were casual towards rule breaking, and each of the 10 rules had been broken more frequently by extraverts than by introverts, for example 12.4 vs 5.2 for no males in room after hours, 8.5 vs 3.0 for no skipping tutorials, and 15 vs 7 for no stealing books. Despite neglecting other personality factors, all the findings for males and females were in the predicted direction – which is the sort of act that astrology has to follow.

7.6.1986.4 Traditional tests of 68 terrorists

Cornelis Kuypers, *AinO* 1(2), 21-23, 1986.

A study by Luigi Squitieri of 68 terrorists (see 7.6.1985.3) had tested the hypotheses, based on tradition, that they should contain: **(1)** More Cancer, 4th house, Libra, and 7th house than expected. **(2)** Less Scorpio, 8th house, Aquarius, and 11th house than expected. **(3)** More 12th house than 6th house. **(4)** More angular Mars, Uranus and Neptune than expected. **(5)** More aspects than expected between the luminaries and the above planets, and fewer aspects than expected between Jupiter and Saturn. None of the hypotheses were supported. But when Kuypers re-analysed the aspects using 10° orbs, he found a surplus of squares from Uranus and Neptune to the Sun, Moon and Mercury as follows:

10 Sun-Uranus	13 Moon-Uranus	9 Mercury-Uranus
10 Sun-Neptune	11 Moon-Neptune	13 Mercury-Neptune

Assuming uniform planetary motion, the expected number of squares between two planets with 10° orbs is $2 \times (2 \times 10/360) \times 68 = 7.6$, in which case a count of 13 is significant ($p = 0.05$) and in the direction predicted by tradition. **Comment** Because Mercury is never far from the Sun, similar surpluses of their squares to Uranus and Neptune are to be expected, as would the Moon surpluses if the Moon happened to occur near the Sun in this small sample of 68 terrorists. So without a check of these points it is not possible to decide if the Kuypers's results could be due to chance. In any case the effect is not large enough to be useful. But Kuypers would disagree about the last point, see 7.7.1987.1.

7.6.1986.5 Sun harmonics for 112 scientists

Albert Bredenhoff, *AinO* 1(2), 30-33, 1986.

Harmonic aspects were analysed for the first twelve harmonics between the Sun and each of the five outer planets in the birth charts of 112 Nobel prizewinners (42 physicists, 36 chemists, 34 doctors). The orb for the conjunction was 10° and was proportionately smaller for the harmonic aspects, for example the orb for the sextile was $10/6 = 1.67^\circ$. Overall there was a small surplus of hard harmonic aspects (249 observed vs 231.7 expected) and a larger surplus of soft harmonic aspects (452 observed vs 372.6 expected). The former include such supposedly difficult aspects as the septile, decile and novile. **Comment** The expectancies assume uniform planetary motion, which does not apply to the outer planets, so no clear conclusion about these small differences is possible.

7.6.1987.1 Can 26 psychology students pick their own readings?

Th Köhler and J-A Leopold. [Validity of astrological chart readings] *Psychologische Beiträge* 29, 567-574, 1987. Many similar studies have been made. This one shows how a few simple additional observations (2,3 below) can be useful.

The subjects were 32 psychology students at the University of Hamburg aged 21-31. They were divided into eight groups of four of the same sex, same sun sign, and roughly the same age (range of age difference 3-10 years, mean 6 years). Volunteers were obtained by notices

and announcements at functions via a contact person.

From the exact birthdate and birthplace of the subjects, chart interpretations were made covering various general behaviour areas and partnership behaviour areas. The interpretations were based on various astrology books, especially B & L Huber *Die astrologischen Häuser* 3rd edition 1981, and Thomas Ring *Astrologische Menschenkunde* Volume III 5th edition 1981. Each subject in the group, known only by a code number, received all four interpretations and had to indicate (1) The interpretation that fitted them best and second best. (2) The accuracy of their first choice expressed as 100%, 70%, 50% or <50%. (3) Whether judgement had been easy or had involved much hesitation. The authors do not say how lengthy the interpretations were and whether all cues were excluded, but the person who wrote the interpretations had no contact with the subjects, which should be enough to avoid any major bias.

Unfortunately six subjects did not reply, so some groups were incomplete. But all subjects received four interpretations. Re (1), the observed hits for the 26 subjects that replied were:

Group	Number of hits for 1st choice		2nd choice	
	Obs	Exp	Obs	Exp
3 groups of 4 subjects each	3	3.0	3	3.0
4 groups of 3 subjects each	4	3.0	4	3.0
1 group of 2 subjects each	1	0.5	0	0.5
	---	----	---	----
Total hits	8	6.5	7	6.5
Total misses	18	19.5	19	19.5
Binomial p of Hits vs Exp	0.31		0.48	

The results are marginally in the right direction but are not even marginally significant. Re (2), the number of cases with the estimated level of accuracy for their first choice were:

Estimated accuracy	50%	70%	100%	
Hits (8 cases)	1	7	0	Mean 68% sd 7%
Misses (17 cases)	2	9	6	Mean 78% sd 18% (1 subject did not reply)

A valid system should show higher accuracy for hits than misses, but the results are in the wrong direction. Re (3), the number of cases with the estimated time for first choice was:

Estimated time taken	Very quick=1	Short=2	Long=3	
Hits (8 cases)	1	4	3	Mean 2.25
Misses (18 cases)	3	8	7	Mean 2.22

In a valid system hits should be easier (thus quicker and less trying to count) than misses. But if anything the results are again in the wrong direction.

7.6.1987.2 What does Pluto mean? Part 1

Part 1. Terry Dwyer, *Correlation* 7(2), 9-13, 1987.

In Part 1 a sample of 175 mixed adults completed a 36-item questionnaire addressed to likely Pluto meanings, namely intensification, exaggeration, social power, transformation, and suppression. Each question (after adjustment to the same direction) was scored 1 for yes and 0 for no, and the mean score for subjects with the aspect was compared to that for subjects without the aspect. For example, *Do you experience intense emotions as a rule?* (aimed at Moon-Pluto aspects) gave these mean scores and standard deviations:

81 subjects with a Moon-Pluto aspect	3.33	sd 2.16
94 subjects without a Moon-Pluto aspect	4.05	sd 1.68

By t -test the difference is significant ($p = 0.014$) but is in the wrong direction, indicating that Moon-Pluto aspects do not intensify the emotions. Of the 36 comparisons between question and the corresponding aspect, and the 36 x 8 comparisons between question and the remaining aspects, 11 were significant at $p = 0.05$, less than the 16 expected by chance. Re-analysis in terms of hard vs soft, close vs wide, or weighting by aspect strength, gave no improvement.

7.6.1987.3 What does Pluto mean? Part 2

Part 2. G Dean and R Smit, *Correlation* 7(2), 14-21, 1987.

In Part 2 the sample was divided into two replicate groups. The correlations between each answer and (1) aspect strength for three kinds of aspect (multiples of 45°, 30°, and 7.5°), and (2) Pluto's strength by angularity (weighted 15 when exactly on an angle and 0 when exactly midway between angles), revealed no discernible pattern. But this could be due to single questions being generally a poor measure of what they are supposed to measure. To improve reliability the questions with the clearest meanings were then grouped by theme to give three themes each based on seven questions. Reliability as Cronbach's alpha, which is generally satisfactory if over +0.5, and meanings were:

Power	+0.67	Intense, possessive, compulsive, needs to achieve
Suppression	+0.59	Not expressive, reserved, hides feelings
Transformation	+0.60	Does own thing, prone to changes and upheavals

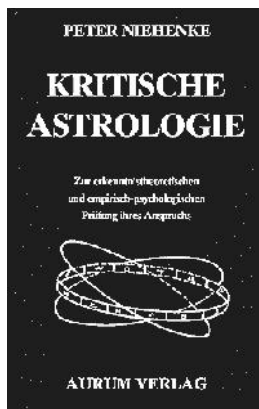
Their intercorrelations for the two replicate groups were:

	Suppression	Transformation
Power	-0.17 -0.39	0.36 0.40
Suppression		-0.12 -0.08

The intercorrelations were much as expected. Thus intense achievers (power) tend to be independent and changeable (transformation), but not reserved (suppression). Nor is suppression related to transformation. The scores for each theme (= total for its seven questions) were then correlated with: (1) Total strength of all nine aspects SO-PL through NE-PL when weighted 4 for SO, MO; 3 for ME, VE, MA; 2 for JU, SA; and 1 for UR, NE. (2) Pluto strength by angularity, calculated as 15 when exactly on an angle through 0 when exactly midway between angles. (3) Combined strength obtained by multiplying (1) by (2), which approximates what an astrologer does when interpreting a chart, thus ME-PL would be considered more important if Pluto was on an angle. (4) Same as (1) through (3) but with random scores instead of actual scores for each theme. The distribution of data within each set showed no dominant skew that would invalidate the statistical tests. Of the $3 \times 4 \times 2 = 24$ observed correlations, the number significant at $p \leq 0.10$ was close to the number expected by chance (2 vs 2.4). Combining aspects with angularity produced no improvement. Correlation between replicates was 0.07 ($p = 0.78$). Results using random numbers were just as good as those using astrology. **Conclusion:** either Pluto has negligible effect or it has a meaning other than its supposed meaning. Either way, popular views are not supported. Part 2 took 250 man-hours of work and several days of computer time. All data and analysis programs were offered on floppy disk for anyone wishing to make additional tests, but in 25 years nobody showed any interest.

7.6.1987.4 3290 responses to a 425-item questionnaire

Peter Niehenke, *Kritische Astrologie* 1987 and (for aspects) *Astro-Psychological Problems* 2(3), 10-15, 1984.

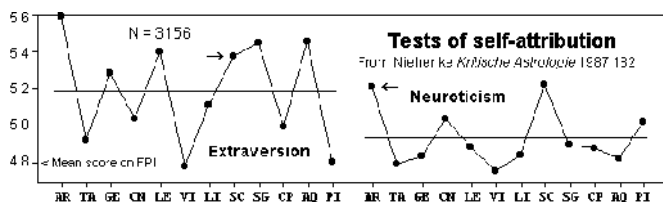


In 1980, as part of his work for a PhD in psychology, German astrologer and psychotherapist Peter Niehenke prepared 12,000 copies of a 425-item questionnaire designed to test astrological claims. The questionnaire and a copy of the 211-item Freiburg Personality Inventory were sent out in response to ads in an esoteric magazine, two newspapers, and notices at Freiburg University. Each package totaled 16 A4 pages. Eventually 3498 were returned – altogether more than 110 reams of A4 – of which 3290 provided usable birth data (62% from birth certificates). The questions had been tested in a pilot study to make sure they were free of problems. Each was relevant to a given chart factor (sign, house position, or aspect) to see if the subjects identified with that factor regardless of whether it was actually in their birth chart. For example the relationship to Aries was established

by questions about impulsivity, competitiveness, assertiveness, and impatience, all traits being taken from reputable textbooks such as Thomas Ring's 1969 three-volume *Astrologische Menschenkunde* [Astrological Person-Descriptions]. This allowed it to be tested against the actual presence of Aries in the chart, and vice versa. Similarly the relationship to Sun-Saturn aspects was established by questions about misfortune, disappointment, pessimism, and guilt feelings.

Thomas Ring (1892-1983) describes Sun-Saturn aspects as follows: "Frequent unexplainable misfortune, delays, missed opportunities ... lack of success through the expectation of failure ... weak nature, shy, bad mood, profoundly pessimistic ... problems with feelings of guilt and need of punishment; justice and injustice" (Volume III:268). He was trained in both psychology and astrology and was able to translate astrological concepts into psychological terms.

The author's initial focus was self-attribution, which he explored via the subjects' inventory scores for extraversion and neuroticism. His results confirmed the 1978 results of Mayo, White and Eysenck for sun signs (see 8.3.7), which also confirmed that his own subjects had some knowledge of astrology (unremarkable because Niehenke had labeled his paperwork "An investigation of astrology", thus cueing them in the right direction). His results look like this:

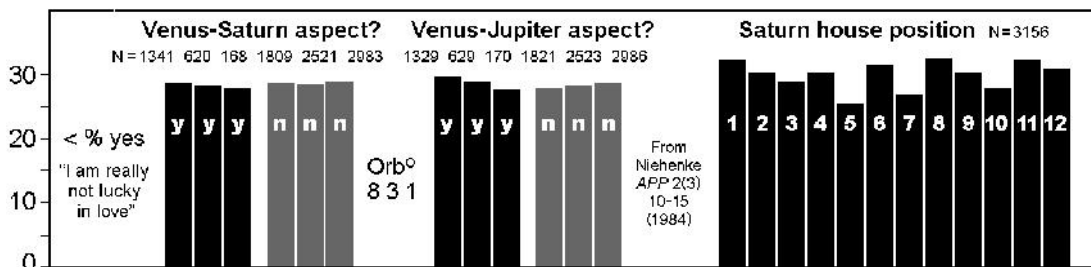


Only two signs (arrowed) did not fit – Scorpio for extraversion and Aries for neuroticism. The effect sizes are about 0.07 for E and 0.05 for N, which are similar to those generally observed.. Results are from Niehenke 1987:182

There was also a strong age effect because younger subjects and older subjects did not share the same outer planet positions. For example there were strong but spurious correlations with the sign position of Uranus and Neptune, peaking with Neptune's occupancy of Scorpio during 1957-1970 which automatically excluded all subjects over 25 and resulted in $p = 10^{-148}$. When the questionnaire responses were corrected for age effects and self-attribution, no significant correlation with any chart factor could be detected (p.186) despite the high sensitivity of the large sample which could reliably detect an effect size of $\sqrt{(10/3290)} = 0.055$, see 8.3.

The author's next focus was houses and aspects. When the answers to questions involving factor X were tested against the presence of X in birth charts (and with the sample divided in two to provide a replication), none of the results that were significant in the first half replicated in the second half. Overall no consistent result appeared for any factor including Gauquelin planets in key sectors, and aspects between outer planets and Sun, Moon, Venus, Mars, Ascendant or MC. For example subjects with four Saturn aspects (said to indicate heavy responsibility and depression) felt no more depressed than those with no Saturn aspects. It made no difference what the other planet was. Nor was there any relation with scores on the FPI depression scale. Responses of Saturn-aspected subjects did not replicate above chance.

Other planets performed just as badly. For example subjects with good trines to Jupiter felt no sunnier than those with none. Moon-Mars, Sun-Mars and Ascendant-Mars aspects showed no relation with scores on the FPI aggressiveness scale. Responses to the question "Ich habe einfach kein Glück in der Liebe ja/nein" [I am just not lucky in love yes/no] showed no effect for Venus-Saturn aspects, Venus-Jupiter aspects, or Saturn house position, all of which according to astrological tradition should have been highly relevant:



Left and centre: Subjects were equally unlucky in love regardless of whether they had Venus-Saturn aspects (unlucky in love) or Venus-Jupiter aspects (lucky in love) regardless of orb. If anything, persons with Venus-Saturn aspects were slightly less unlucky than persons with Venus-Jupiter aspects, which is contrary to tradition. A difference of 3% on the vertical scale would be weakly significant. **Right:** according to tradition, Saturn for those unlucky in love should be over-represented in Placidus houses 5 (love) and 7 (partners), but the opposite was observed. For Jupiter the results were no better. Data from Niehenke, *Astro-Psychological Problems* 2(3), 10-15, 1984:11,15.

In 1986 and 1987 the author sent a short questionnaire to the German magazine *Esotera* asking readers about their experiences with astrologers. He received 150 replies. How accurate was the reading? 77% said "absolutely right" or "generally right". Was it helpful? 71% said yes and 34% said it had helped them make a decision (they didn't say if it was good or bad).

Niehenke could not explain why his results contradicted the above positive experience with astrologers, and his own positive experience as a professional astrologer and president of DAV, the German Association of Astrologers. But was it resolved by "the idea of mediumship":

Astrology receives its fascination and its demonstrable therapeutic fertility through association with an ingenious system of great sophistication. The association may not be a real one simply because the attractiveness and form of the system can themselves be helpful in the search for one's self. ... The attractiveness of the mediumship idea is that it resolves this contradiction [by positing] a symbol system of "archetypal force" as a catalyst for the intuitions of good astrologers, allowing them to give individually accurate interpretations (pp.193-194).

Despite his negative results, he still witnessed in his professional practice "the correctness of chart interpretations" and therefore carried on regardless "because I do not generally doubt my senses" (p.194). Nevertheless he points out with deliberate irony:

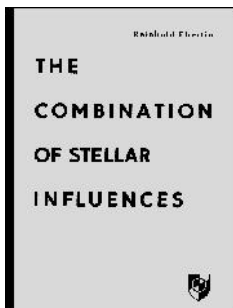
For astrology itself, and its survival even with more such negative results, we do not need to worry. A world in which astrology exists is surely a more enjoyable world than one without it. The need that astrology be a reality is much stronger than all the rational demonstrations against it. This remains for the moment even true for me! (*APP* 2(3), 10-15, 1984:15) (In *Kritische Astrologie* p.194 he accepts "two forms of perception" despite the dividing "great abyss").

Comment Today the presence during a reading of hidden persuaders and other artifacts (which the author does not consider) is a more plausible explanation of why astrology works.

7.6.1987.5 Queen Victoria's haemophilia vs midpoints

Charles Harvey, Astrology and genetics, *Astrology and Medicine Newsletter* No 3, six pages, November 1987. An updated version of a study published eight years previously in the original *Correlation* No 3 for Spring 1969.

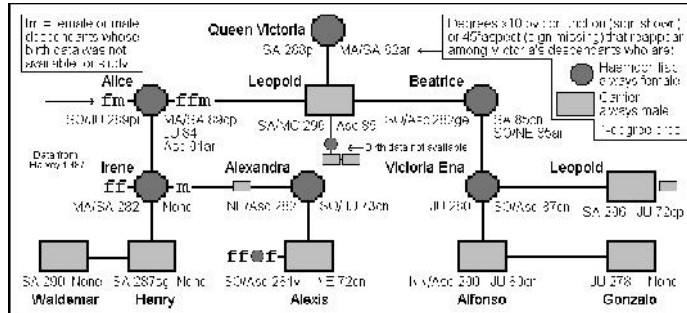
By an incredible stroke of luck (as it were) the mutation that created haemophilia in European royal families occurred in Queen Victoria (1819-1901). Haemophilia is a hereditary disease, ie one acquired not by infection from others but by inheritance from one's parents. Haemophilia is serious and distinctive because it inhibits blood clotting, so bleeding from even the smallest cut is very hard to control. Those who suffer from haemophilia are invariably male, but the disease is transmitted through the female line, so an apparently normal daughter has a 50% chance of transmitting it to her sons, and 25% through her daughters to her grandsons. Such females are called carriers. Roughly half of the individuals in the three generations descended from Queen Victoria are haemophiliacs or carriers. Because the medical history of royalty and their birth places, dates and times are very reliably recorded, these three generations are ideal for the study of links between astrology and genetics.



Also ideal for such a study is Reinhold Ebertin's *Combination of Stellar Influences* 1972, translated from the German by Dr Alfred G Roosedale and Linda Kratzsch, with a translation by Charles Harvey and Ilse Hodges of the 1961 German supplement to the 1950 edition. It is ideal because it gives the biological correspondences (mostly based on symbolism and experience) for every planet, angle, and midpoint.

The author obtained computerised chart printouts including midpoints for every individual with available birth data in the 4 generations starting with Queen Victoria. A comparison of the haemophiliacs and carriers with Ebertin's

biological correspondences showed that the *degree positions* of Queen Victoria's Saturn and Mars/Saturn midpoint (both commonly associated with deficiency and damage) were occupied by various factors in all relevant charts, either by conjunction or by 45° aspect, which is a conjunction in an Ebertin (8th harmonic) chart, all within an orb of 1°. The main results are shown below redrawn from the author's typing. For example Queen Victoria's Saturn at 28.8° Pisces reappears in Beatrice's chart as the Sun/Ascendant midpoint at 28.2° Gemini:



The family tree on Wikipedia shows Alexandra as Alix, Victoria Ena as Victoria Eugenie, Henry as Heinrich. The 3 generations descended from Queen Victoria = 38 individuals, of which 10 are haemophiliacs and 8 are carriers. The

author shows only 26, 5 and 7 respectively, because some birth data were not available, the missed ones are shown as thumbnails and do not affect what follows. Queen Victoria, through two of her five daughters (Alice and Beatrice), passed her haemophilia to European royal families including Spain, Germany and Russia. It was a serious condition and in the 19th century, before the advent of modern medicine, it was generally fatal. Waldemar (b.1889) survived to age 56, Henry (b.1900) died at age 4, but Alfonso (1907-1938) and Gonzalo (1914-1934, the last known descendant to be affected) both died to death after a car accident. Today no European royal family is affected. In about 30% of cases in general there is no history of the disease, which is then seen as the result of spontaneous mutation.

The author cites the "inevitable agreement that must exist between astrology and genetics" [see 8.7.3], and concludes that the above pedigree describes "the transmission of haemophilia with a minimum of appropriate factors and a precision of zodiacal locations", which promises an almost one-for-one correspondence. But "it is impossible to make any meaningful statistical judgement ... only replication on other families can be an adequate demonstration".

Comment This focus on degree areas differs from the normal focus in astro-genealogical studies on sign-and-house positions and aspects, and is thus a welcome addition to the field. Especially as it was conducted by the UK's leading expert in the Ebertin system, which is one of the few systems to automatically include (speculative) medical correspondences in detail.

First a closer look at those correspondences. In the simplified pedigree there are 11 factors whose correspondences are judged by the author to be symbolically appropriate, namely:

SA, MA/SA, SA/MC, NE, Asc, NE/Asc, JU, SO/JU, SO/NE, SO/Asc, and NN/AS (see below for meanings).

Four issues are relevant here, none of them discussed by the author:

(1) The "symbolically appropriate" descriptions given by the author for some of his factors seem somewhat forced when compared with Ebertin's original biological correspondences given in *The Combination of Stellar Influences*. Here the latter are abridged in ():

SA "most often associated with deficiency" (hardening up, loss of organs, old age).
 MA/SA "most often associated with deficiency" (death or atrophy of an organ).
 SA/MC "personal and possibly hereditary deficiencies" (the feeling of being sick).
 NE "indicator of areas of weakness within the organism" (pineal gland, slackness, paralysis).
 Asc "commonly seen as symbolic of the physical body" (reactions to environment and outside world).
 NE/Asc "can certainly be seen as appropriate" (illusions or deceptions of the senses).

(2) The above factors were those the author found to be present. But inspection of Ebertin's biological correspondences in *The Combination of Stellar Influences* reveals around thirty more that were not found but which seem equally appropriate. Here are just eight:

SO (heart, circulation), MO (bodily fluids, blood serum), SO/MO (bodily liquid balance), MO/UR (blood disturbances), MO/PL (blood diseases), MA/NE (paralysed activity), PL/Asc (physical changes), Asc/MC (hereditary factors).

(3) The biological correspondence of JU (the traditional ruler of blood) could hardly be more

symbolically appropriate, yet except for SO/JU no other JU midpoints were involved, such as:

MO/JU (liver and pancreas functions), VE/JU (hormone circulation), MA/JU (heart muscle), JU/SA (chronic disease), JU/UR (organic rhythms), JU/NE (lack of tone in organs), JU/PL (regeneration of organs), JU/MC (good health).

(4) Birth data were not available for 6 of the 18 haemophilia-related individuals who appear in the pedigree. So the author's conclusions were made with some of the data missing.

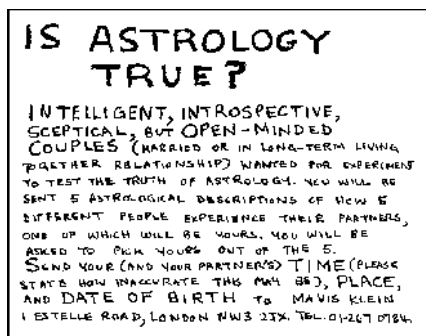
In other words the claimed astrological links with the transmission of haemophilia can be explained by the usual artifacts of selection (thus SA and MA/SA were selected by inspection, not because they were predicted to work) and of confirmation bias, see 9.8.9. But what of the supposed impossibility of making a meaningful statistical judgement? See next:

Within a single sign the cosmic pedigree involves two degree areas (28.8° and 8.2°) each contactable either by conjunction or by 45° aspect, both with an orb of 1° . So the span-at-risk is 2° (orb span) $\times$ 2 degree areas $\times$ 2 aspects = 8° per sign, or (for twelve signs) $12 \times 8 = 96^\circ$ total. Here the 45° aspect counts as one aspect, not two, because its mirror image part is automatically duplicated when its sign is replaced by the eleven others in succession.

So the chance of a hit between any two degree areas in Queen Victoria's chart and any single factor in another chart is $96/360 = 0.2667$, and the chance of a miss is $1 - 0.2667 = 0.7333$. This assumes the non-uniformity of planetary motion will have little effect, which is generally true of contacts between two charts, albeit not within one chart. If for the sake of calculation we assume that 25 factors are symbolically appropriate (ie midway between the 40 that are conceivably relevant and the author's 11), then the collective chance of a miss is $0.7333^{25} = 0.0004$ or effectively zero, and the chance of a hit is effectively certain. This assumes that the original degree-area pair of SA and MA/SA and the target factors were chosen at random whereas they were chosen by inspection (and perhaps massaged to improve the fit as in (2) above), which means that the chance of a hit will be even more certain. Despite the uncertainties it is clear that the conclusion of a demonstrated astrology-genetics link is not supported.

7.6.1988.1 Putting the sin back into synastry N=122

Mavis Klein. Accuracy of relationship description as a test of astrology. *Correlation* 8(2), 5-17, 1988. And personal communication 1987. Expenses (printouts, phone calls, postage) were covered by a £500 grant from Urania Trust.



To test the value of astrology in assessing compatibility, Klein recruited volunteer couples – married or living together – by word of mouth and by notices (pictured) in bookshops and cafes. Subjects had birth times recorded to within 2 hours. A total of 123 couples (246 subjects) volunteered but only 58 men and 64 women sent in responses. Most of the non-respondents claimed the task was too difficult because the readings were too similar. Klein does not indicate the participants' ages.

Each volunteer received an SAE for their reply plus five computer-generated synastry readings, one of them their own, which they had to rank in order of accuracy. Each reading occupied 1–2 pages and consisted of a list of meanings for each major interplanetary aspect between the charts (it was not identified) taken from Martin Schulman's *Karmic Relationships* 1984. The orb was 6° , or 4° for sextiles. Half the subjects received four control readings for pairs picked at random from the others. The other half received four control readings for themselves and fake partners with the same sun sign as their genuine partner, either chosen from the others or computer-generated at random from the years 1930-1960.

These were the days of slow computers and dot-matrix printers. Each set of five couples and controls took up to 1.5 hours to calculate and print out on continuous stationery. Results:

Rank of correct reading		1	2	3	4	5	p by chi2 if each expectancy = N/5
All subjects	N=122	41	34%	30	16.5	14.5	20
Men	58) N=	17	29%	19	6.5	5.5	10
Women	64) 122	24	37%	11	10	9	10
Same sun sign	66] N=	18	28%	23	11	4	10
Random sun sign	56] 122	23	41%	7	5.5	10.5	10
Total	366	123	34%*	90	49.5	43.5	60

*If each rank is equally probable then expectancy = 20%.

Klein noted that all placements in rank 1 exceeded expectancy and concluded:

Notwithstanding the many controlled intervening variables that mitigated against positive results, this experiment has demonstrated the existence of astrology as an independent variable in people's experience of others. ... if refined ... it is to be expected that even more convincing results will be obtained (p.16).

Comment In an earlier study Klein recruited 50 volunteer couples at a 1983 TA psychology conference in Switzerland attended by 750 delegates. Each partner received one authentic synastry interpretation plus four others and ranked them according to accuracy. Each interpretation averaged 60 statements of 10-20 words each based on major aspects between charts of orb 3° and house placements of the other's planets. 36 responses were received, most from couples where both birth times were known. The authentic interpretation was ranked 1–2–3–4–5 in 12–5–13–4–2 cases respectively, which was significantly in favour of the authentic interpretation being chosen ($p = 0.008$ by chi-squared test).

This study was entered in the \$5000 Superprize competition (see 8.9.10.2) and won a consolation prize because it was an example of the kind of research that more astrologers should be doing. But among 750 delegates it was likely that some would know their synastry, and such subjects would tend to pick the authentic interpretation. In other words essential safeguards were lacking. Now back to the present study **with many added comments**.

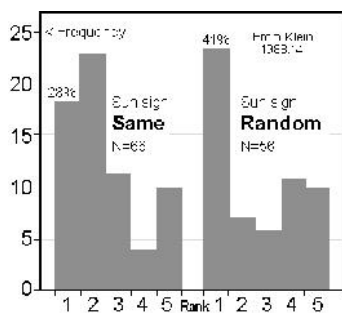
Klein's notice displayed the word *astrology* so prominently that it could hardly fail to attract volunteers who had prior knowledge about astrology. Klein recognised this, and says:

people with more than a very cursory knowledge of astrology were excluded from the experiment. Once knowledge of astrology was thus controlled, self-selection of subjects was accepted (p.7).

But she does not say how this crucial control was actually achieved other than:

(a) by excluding all reference to Sun-sign characteristics; (b) by the control subjects all having the same Sun-sign as the experimental subjects (p.6). ... The experimenter [Klein] was conscious of not asking for subjects who were totally ignorant of astrology ... because [this] may be taken to imply a below-average interest in human psychology, and an above-interest was needed by subjects in order for them to participate meaningfully in this experiment (p.8). [This is hardly convincing – ignorance might only mean they had been too busy to study astrology despite being interested]

However, if (a) was actually successful, why is *same* sun sign so different from *random* sun sign in the above table (28% vs 41%)? Klein explains the difference by plotting the relevant



◀ counts shown in the previous table and claiming:

the distribution of placements among subjects sent *same* Sun-sign controls [left] is clearly more random than the distribution of placements among subjects sent *random* Sun-sign controls [right], which supports the astrological hypothesis that, other factors being equal, people having the same Sun-signs tend to be more alike than people having different Sun-signs (p.16).

Here the claimed difference is by no means obvious. But even if subjects with the same sun sign did tend to be alike (which tests have consistently failed to show), how could such a difference be detected if sun sign characteristics were excluded in the first place? It would be like claiming colour was detected in black and white pictures.

There is an important point here for designers of research experiments. It would have been less confusing to use the same fake readings for everybody, since this would have provided a

stable standard for comparison and thus made the results easier to interpret. Just one fake reading for each couple would have made it even easier.

That said, Klein suggests the difference between first ranks (28% vs 41%):

dispels the concern that collusion between partners (possible only for the *same* sun sign subjects) would make for more 1st place responses than among *random* Sun-sign subjects (p.16).

But surely collusion (comparing notes) does not depend on having the same sun sign? Who says sign X cannot talk to sign Y? It seems unlikely that the partners would not collude, in which case synastries judged to be accurate, or which conformed to prior knowledge, will give more hits than expected in rank 1. And they do – 9 hits vs $57/25 = 2.3$ expected, binomial $p = 0.027$. In the remaining $25-1 = 24$ cases there is no compelling reason to expect better agreement than chance for the 4 remaining *same* ranks than for the $24-4 = 20$ remaining *other* ranks. But it is actually significantly better, where chance is $(57-9)/24 = 2.0$ per rank:

Agreement in the 4 same ranks	Obs = 14	Exp = 8.0	
Agreement in the 20 other ranks	34	40.0	p by chi2 = 0.020

If as a precaution we also exclude agreements in rank 2, the outcome is still significant:

Agreement in the 3 same ranks	Obs = 9	Exp = 6.0	
Agreement in the 18 other ranks	26	36.0	p by chi2 = 0.040

In other words the remaining rankings of the correct synastries agree better than we would expect by chance if there was no prior knowledge of astrology, so we have some reason to be suspicious. If all couples agree on rankings but choose the correct synastry only by chance, all counts be zero except those on the diagonal, which would tend to be uniform. But actual diagonal counts of 9-5-3-1-5 tend to be non-uniform. So our suspicion is supported.

A worse problem is the actual readings. Klein gives no examples in her article but she kindly provided six pairs on request. The number of aspects per synastry reading ranged from 16 to 33 with an average expectancy of about 26. Her article had described the readings thus:

Many of Schulman's interpretations were condensed and simplified for maximum clarity and minimum ambiguity. While the experimenter [Klein] was aware that Schulman's orientation is by no means universally popular amongst astrologers, out of her own experience as a practising psychotherapist, she has found Schulman's interpretations to be amazingly congruent with the statements people actually make about their experiences of their partners (p.10).

But on inspection the readings seemed remarkably dense, wordy, and difficult to cope with. Instead of clear statements in plain English like "she is more practical than him" or "he is outgoing but she is reserved" there were only clouds of Schulman-speak like:

- I help my mate grow to appreciate the value of responsibility, and he helps me transcend the orthodoxy of my thinking.
- I want my mate to become aware of the passion and pain within him that will transform him into a higher level of consciousness.
- My partner seems not to appreciate my intellectual understanding of our relationship through which I want to define the roles we play with each other.

It is hard to believe that anyone could cope with this without mental exhaustion. No wonder that more than half the volunteers did not continue. There seems no reason why statements could not be clear like these from Margaret Hone's *Modern Text-Book of Astrology* 1968:264:

- She idealises him.
- Strong physical attraction
- Similarity of basic self-expression.
- His mental ability brings her out, she delights his mind.

But the problems have only just started:

(1) The readings are quite long because the orbs (typically 6°) are considerably wider than those considered by specialists in synastry to be effective (namely "less than 2°-3°", see *Recent Advances* 1977:335), which increases the number of aspects pro rata. (2) Despite the wide orbs there is no weighting by orb, so a wide aspect indicating a weak X has the same status as

an exact aspect indicating a strong X. (3) Aspects between outer planets change too slowly to be characteristic of individual cases, yet they are given the same prominence as the rest. All of which is the exact opposite of how a proper synastry should be prepared. So the result was often conflict where none should exist. For example (both are from female versions):

- We co-operate without competitiveness.
- We have a passionate and intense relationship fraught with constant battles, which seem necessary for survival.
- I want to slow my mate down and soothe his fiery nature.
- My mate accuses me of being too aggressive, but I think this is because he is too passive.

Contradictions can of course be explained away (*people are naturally full of contradictions*). But when ranking is requested for research, such contradictions get in the way, leaving only excuses for answers (*I'm sorry experimenter, it is just impossible to tell*).

(4) The male and female readings for the same aspect differed according to what Schulman saw as the differing roles of men and women. For example:

- For him: I try to conquer my partner, but she eludes me.
- For her: My partner seems to look for a stereotype in me rather than seeing me for what I really am.
- For him: I need to teach my mate the values of practicality and responsibility.
- For her: I want to prove myself to my mate to earn his full love and appreciation.

If the interpretations are to be a test of synastry rather than of Schulman's ideas about gender roles, they should depend only on who has which planet. But they don't.

(5) The readings generally betray a slavish devotion to symbolism as if to make each aspect read differently from the nearly 400 others. Thus the astrological factors behind *she gives him peace/comfort/security* are quite different, but how strictly would people distinguish between them? Unless different factors convey clearly different meanings to subjects, there is no point in interpreting them separately.

(6) There is no reference to the natal charts, which in most synastry books is said to be fatal. For example in the above case where his mission was to teach her the values of practicality and responsibility, she had a close SO-180-SA and MO-60-SA, so her ability to manifest precisely these values was astrologically beyond question. So both partners were being asked to rank readings that didn't make astrological sense, ie the teaching of values she already had.

Klein blames her crude unweighted unsynthesised approach on a trial run where she used:

holistic essay-type interpretations of each subject's experience of his or her partner. From the spontaneous feedback she received from some subjects, this approach appeared ill-advised, as it did not accord with the way people consciously experience each other. [Despite] attempts to know ourselves as integrated wholes, we actually experience each other piecemeal, as collections of separate (and often contradictory) characteristics (p.10).

Conclusion. No studies are quoted to support this. Instead the feedback might merely confirm a preference for Barnum statements. Which is not to deny Klein's initiative, hard work, and the importance of testing individual aspects. But when the research community is understandably desperate for signal, it makes no sense to deal mostly in noise. Many felt this was the best of the studies reported at the three-day research conference in 7.3.1987.1. But others who were familiar with the unreported details held a contrary view, as did the five specialists we asked for comments. To put it another way, in 1987 the Urania Trust gave £500 towards this study. With the benefit of hindsight, what would you have given?

7.6.1988.2 Retrograde Uranus and 491 murderers

Lorna Houston, Françoise Gauquelin, Arno Müller, and Mike O'Neill, *APP* 6(3), 23-25, 1988.

Lorna Houston obtained a significant frequency of Uranus retrograde positions in the birth charts of 132 murderers, see *APP* 6(2). So she checks on a new sample of 491 murderers to see whether this result is replicable. Her new result is in the same direction but not significant.

So does it confirm the first outcome? Two readers of *APP* (Müller and O'Neill), one of them a university professor, tell us how astronomical and demographic effects could explain the outcomes. This will have to be further investigated. **Comment** Follow-up checks on the original data appeared in *APP-NCGR* 7.2, 27-31, 198 by Pottenger, Müller and O'Neill, but demographic effects were too strong to allow a clear conclusion. Inexplicably an accompanying study on pages 23-25 by Lorna Houston, using a new sample of 110 murderers from the Canadian Centre for Justice Statistics, did not look at links with retrograde Uranus.

7.6.1992.1 Matching charts to biographies of notable physicians

A Müller and S Ertel, *Zeitschrift für Parapsychologie und Grenzgebiete der Psychologie* 34(3/4), 217-221, 1992.

An astrology study group of seven German astrologers of national repute asked to be tested on their ability to match charts to biographical information. Birth data were collected for notable physicians born 1892-1923 with a minimum of 4 column-centimetres in *Kurschners Deutscher Gelehrten Kalender* [German scholar's almanac] 1961, and cases with birth times recorded as whole hours were rejected. The result was 45 cases, of which 19 had birth times recorded to 30 minutes, 24 had birth times recorded to 15 or 45 minutes, and 2 were more exact.

Each case was paired with a control obtained by either adding or subtracting 2 years, 2 months and 2 hours from the genuine birth, and then divided into two sets of 23 and 22 pairs. Charts were calculated by the astrologers, who then decided together as a group which chart in each pair was the notable physician. For each judgement the group gave its confidence on a scale of 1=very certain, 2=fairly certain, 3=fairly uncertain, and 4=very uncertain.

Their mean confidence was 2.5 or exactly halfway. Two charts were considered very uncertain. Of the remaining 21 charts, 9 were correctly matched, less than the 10.5 expected by chance. After being told the gloomy result, the astrologers matched the second set. This time 7 charts were considered too uncertain. Of the remaining 15 charts, 6 were correctly matched, which again is less than the 7.5 expected by chance. The combined results showed no consistent variation with type of physician (surgeon, psychiatrist, intern) or with confidence:

Confidence:	Very certain	Fairly certain	Fairly uncertain	Very uncertain
Hits/N (%)	3/7 = 43%	9/20 = 45%	3/9 = 33%	4/9 = 44%

The group gave the following reasons for its failure, with Müller and Ertel's response in ():

- Astrologers were not representative (but they were all qualified and reputable DAV astrologers, some with many publications).
- Being a notable physician is not enough to be seen in a birth chart (but they had said it would be very clearly seen).
- Control charts did not differ enough from the genuine charts (but the 45 genuine charts spanned 31 years averaging 8 months apart. If the two-year difference for controls was too little, does it mean everyone is a notable physician?).

7.6.1992.2 A collaborative Vernon Clark experiment

John McGrew and Richard McFall, *Correlation* 11(2), 2-10, 1992.

Six astrologers matched 23 birth charts to comprehensive case files, including photographs and their own seven-page 61-item questionnaire that covered

hobbies, interests, school grades, best and worst subjects, talents, vocational interests, past and present jobs, education and occupation of parents, type of neighbourhood where they lived, relationship with parents and siblings, dates of deaths in family, dates of moves across the country, birth defects, disfiguring injuries, deviant behaviour, convictions, whether a victim of serious crime, honesty, main personal problems, religious beliefs, health problems, fondness for travel, phobias, dislikes, attitude to authority, sexual relationships, loyalty, favourite colours, ideal living situation, punctuality, perseverance, a night or day person, strengths and weaknesses of best friend, goals in life, height, weight, hair colour, eye colour, skin colour, and race.

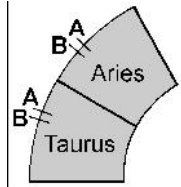
Each question was open-ended rather than forced-choice because the astrologers felt this better represented everyday astrological practice. The charts were of 23 Americans (4 men, 19 women) aged 30-32 years. The information provided was much more than would be involved in a typical consultation. Birth times were verified by birth records and in most cases were recorded to within five minutes or better. **Results** When expressed as a correlation (0-1) the

mean accuracy was 0.02 and the mean agreement between astrologers was 0.03, both negligible. Accuracy was unrelated to confidence or to birth-time precision. In a follow-up study, five groups of 5-6 astrologers each matched a subset of 5 charts, so that collectively all 23 charts were matched. Mean accuracy was -0.15, i.e. worse than chance and in the wrong direction. The astrologers had collaborated to make the experiment as fair as possible, but the negative findings had no effect on their belief in the validity of astrology, see 7.7.1996.2.

7.6.1992.3 Proof of astrology by 238 pairs of twins

Suzel Fuzeau-Braesch, *Astrologie: La Preuve par Deux* [Astrology: proof by twins] Paris 1992, a book of 244 pages. Summarised by the author in *Personality and Individual Differences* 13, 1135-1144, 1992.

I prepared brief astrological descriptions (2-10 words) for 238 pairs of French twins median age 9 years (103 pairs by personal contact, 135 pairs via a twin association), based on planets near angles $\pm 15^\circ$, or rising sign if no angular planets.



If the Ascendants A and B are in the same sign (as is common), then in this example in both cases A is more like Aries and B is more like Taurus. This is not traditional but is objective.

The parents (usually mothers) of each twin pair, sometimes non-parents, decided which twin best fitted each description. For example they had to decide which one (Ann or Celine) was less sociable, and which one was more sociable. Or which one (Nicolas or Richard) was more expansive and more firm, and which one was more sensitive, receptive and affective. If no decision was possible it was counted as a void (half a hit and half a miss). The observed hit rate was 68.5% vs the 50% expected by chance, $p = 0.6 \times 10^{-8}$. I concluded that, for differentiating twins, "astrological factors are alive and well" (p.208), and that "much the same applies to every individual birth" (p.136). **Comment** But others found problems. First Henri Broch and then Laurent Puech discovered that the persons making the responses could not be reached, nor would the author provide copies of the forms used. According to her list of birth data, three pairs were born at sea 25 km off the coast of Nice. At least



two pairs were not listed in official birth records. The study was made in 1990, yet two pairs were born in 1990, three in 1989, and four each in 1988 and 1987, ie 13 with a mean age of 2 years. Indeed, 133 pairs were under 10 years, and only 62 pairs were 20 or over. Are twins unable to change as they mature? Puech suggests these findings "posent le problème de l'honnêteté intellectuelle de cette dame" (*Astrologie derrière les mots* 2003:132). Ertel and Dean (*Personality and Individual Differences* 21(3), 449-454, 1996) found further problems:

The author's result was incompatible with previous findings; hit rate was improbably high given the likely low reliability of the measures; the interval between births did not increase with increasing personality difference as required by astrology (fraternal twins differ more than identical twins); the astrological descriptions frequently differed from those prescribed by her rules; 80% of pairs required rating two or more traits together such as more mobile and more independent (which creates ambiguity if one twin is more mobile and the other is more independent); uncontrolled response set and stereotypes had likely biased the responses; there were discrepancies between the published responses and those actually reported, and between the reported birth order (secondborn always first) and the actual order. They compared the original typed traits on each form (which Fuzeau-Braesch had now provided) with computer-calculated charts to identify the twin they referred to, then compared the parents' response with the hit or miss reported by Fuzeau-Braesch, and found 42 discrepancies. The result was now 53.6% hits, $p = 0.16$, which was consistent with the above response biases.

A replication by Mick O'Neill using 106 twin pairs obtained via ads in astrology publications achieved a nonsignificant 51.9% hits ($p = 0.39$), the small excess (1.9%) of hits being possibly

due to a tendency of astrology readers to volunteer data that supported astrology. A subset of his data for which Fuzeau-Braesch had prepared the descriptions achieved only chance results ($p = 0.50$). Ertel and Dean concluded that a purely astrological interpretation of her results was unwarranted. Nevertheless Fuzeau-Braesch claimed her study and the Mars effect were "serious statistical experiments ... alone sufficient to prove scientifically that there is something objective – with real effects – in astrology" (*Pour astrologie* 1996:138). In her rebuttal (*Personality and Individual Differences* 21(3), 455-457, 1996) Fuzeau-Braesch claimed among other things that the assumed low reliability of her measures was not explained (in fact it was fully referenced), her birth chart interpretations were superior to their computer interpretations (in fact their computer-calculated charts were not computer-interpreted), the translation (by her?) of her French book for her article contained errors, and that "the intervals between births have nothing to do with zygoticity" (p.457) (in terms of personality, their point exactly).

7.6.1992.4 Astrologers and the \$Can100,000 challenge

Donald Gilbert, Denis Labelle, Clause Lafleur. *Le Québec sceptique* 23, 1-5, September 1992. By 2003 more than 20 skeptic groups around the world offered a total of \$US2.3m in prizes for any demonstration of authentic paranormal phenomena, but so far without success. In 1992 they included *Quebec Skeptics* (\$Can100,000), *Australian Skeptics* (\$A100,000), and *Indian Skeptics* (Rs100,000). Initially applicants have to say what they can do and what they would accept as a failure, but few astrologers apply. One who did was a French Canadian astrologer of 25 years experience.

The astrologer was Mrs Agathe Vir Landriault of Quebec who claimed "I return justice to the stars by methods of calculation, not by clairvoyance", and that any person will recognise at least 75% of themselves in her chart interpretations. The mutually-agreed test was a simple one. The astrologer would prepare chart interpretations for 7 anonymous women (provided by the authors) and identify them only by a letter A-G. The subjects (who didn't know which letter was theirs) would rate each interpretation out of 100. The astrologer claimed the subjects would give their own interpretation a rating of around 75, and the others rather less.

Before an audience of 50 skeptics and 10 supporters of astrology, the ratings of the 7 subjects (identified only by letter) for each of the 7 interpretations were displayed. The astrologer knew which letter belonged to each date of birth. The authors knew which date of birth belonged to each subject. Only by coming together could they identify which interpretation belonged to which subject. Here are the ratings. * indicates the subject's own interpretation:

Subject	----- Chart interpretation -----							Total	
	A	B	C	D	E	F	G		
2 = A	21*	12	31	42	30	20	39	195	Mean min/max in each row 16/45
6 = B	23	40*	33	34	26	30	28	214	Mean total per subject 203
1 = C	30	24	38*	11	12	12	23	140	Observed total of * 233
7 = D	79	23	26	28*	21	33	27	237	Required for $p = 0.001$ 285
3 = E	19	24	10	33	37*	29	33	185	
4 = F	48	15	42	34	47	40*	36	262	Correlation between ratings
5 = G	35	21	21	23	21	27	39*	187	for each pair of subjects
Total	255	159	191	205	194	191	225	1420	-0.88 to +0.54, mean -0.06

The subjects rated their own interpretation 21, 40, 38, 28, 37, 40, 39 (mean 34.7), much less than the claimed 75 but slightly higher than the other interpretations (mean 28.3). The difference was in the right direction but was not enough to reach $p = 0.001$ and win \$Can100,000. Only subject 7 gave a rating close to 75, but that was for A belonging to subject 2, whereas subject 7 gave only 28 for her own interpretation D. In three of the four cases (BCEG) where subjects gave their highest rating to their own interpretation, another was almost as high. The authors concluded that the astrologer had failed in her bid to win \$Can100,000, but deserved much praise for subjecting herself to testing. She was presented with a bouquet of flowers. Afterwards the astrologer said she had asked her clients how it would affect them if she failed. They told her that she gave them unique information not easily found elsewhere, so it would take more than tests by Quebec Skeptic to shake their confidence.

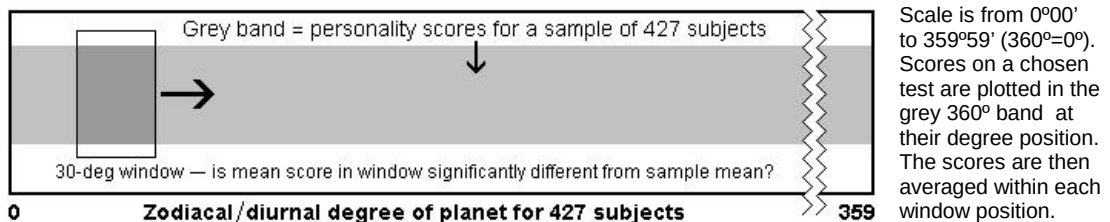
Comment The Quebec Skeptics \$Can100,000 challenge was launched in 1990 and after six

years had attracted 58 applicants, six of them astrologers. The first is described above. Three withdrew after applying, one lapsed, and one failed a preliminary test. In 1996 the prize was increased to \$750,000 with the support of two millionaires and was launched on a popular TV show, with articles the following day in every major Quebec newspaper. In two months it attracted 45 applicants, none of them astrologers. However a palmist failed a preliminary test, two numerologists withdrew after applying, and a believer in angels could "feel" when they spoke to her but could identify nothing testable. But the number of applicants dwindled until around 2000 the millionaires withdrew their support. Since then the prize has been \$10,000 and up to 2016 it attracted 52 applicants or 3 a year. Only one was an astrologer, this time from France, whose readings of personality and health for two timed births were almost completely wrong. Most applicants withdraw rather than help design a mutually-acceptable test. Evidently they find rigour too discouraging. From *Le Québec sceptique* 36, 18-26, 1996 and 58, 37-42, 2005; and challenge organiser Louis Dubé (personal communication 2016).

7.6.1993.1 Personality scores vs astrology for 427 subjects

Pierre Dicharry, *Les Cahiers du RAMS* 1, 11-38, 1993; 2, 4-22, 1994; and 3, 13-25, 1995. This study was one of the first major studies to appear in *Les Cahiers du RAMS*, see 7.3.2018.1 postscript.

Planetary sign and house positions of 427 adults (birth data from birth certificates) were compared with scores on an unspecified personality test related to job search. Mean age was 31.3 years, range 20–55. The personality test gave scores (1–9) on 24 scales such as balance, empathy, energy, failure-avoidance, fighting spirit, goal-dependence, incisiveness, persistence, self-confidence, self-dependence, and sociability. For most scales the distribution of scores tended to be normal (mean 4.90, range 3.07–7.35), usually with high standard deviations (mean 1.80, range 1.37–2.03). The test involved moving a sampling window 30° wide along the 360° of the zodiacal or diurnal (Placidus house) position as shown schematically below.



A window mean score outside the 98% confidence intervals for the whole sample was taken to reveal a significant effect provided the window sample size was at least 30 (samples <30 were ignored). In effect Dicharry was testing sign and house effects independently of cusp locations. In general sign positions were more significant than house positions, but the results were too contradictory to allow a conclusion. For example Gemini had high sociability (hit) but Cancer had low emotional balance (miss); Leo had a strong self-esteem (hit) but Virgo had a strong need to dominate (miss). So he concludes "One cannot make any judgment on the accuracy of traditional elements" (1994:11). **Comment** Dicharry (quoting *Recent Advances* 1977) says "Despite many global studies, research on the validity of astrological claims demands more effort" (1993:11). But knowledge of the studies made since 1977 would have alerted him to the futility of his otherwise admirable approach. Thus the average number of subjects per window ($427/12 = 35.6$) is too small, and the number of scales (24) is too large and of too unknown a validity, to have any hope of escaping chance effects, especially as there were no controls and no attempt to see if any result replicated. His study was doomed from the start.

7.6.1993.2 Difficulties in studying Pluto

Marian van Brakel, *AinO* 8(1), 36-41, 1993.

Illustrates the difficulties that can arise when attempting to do astrological research. In my astrological practice I had become intrigued by the link that transiting Pluto seems to have

with difficult periods in the lives of my clients. So in March 1991 I joined a committee to study the effect of Pluto. We advertised for subjects willing to be interviewed and collected 13 useful birth charts. But not everyone could interview subjects, we were inexperienced in research, we could not agree on the results or on how to proceed, astrologers who knew about science criticised our approach, and ordinary astrologers wondered what we were doing and thought it was all a waste of our time. The committee was dissolved in April 1992. The article ends with a plea for suitably trained people to start a new research project that avoids the above pitfalls.

Comment But they already had. See 7.6.1987.1 and 7.6.1987.2.

7.6.1995.1 Testing 7th house rulerships on 2825 couples

Margot Tollefson, *APP* 11(1), 18-19, 1995.

Among married couples, do any chart placements of one partner look as if they rule the 7th house of the other? This idea was tested on 2825 couples from the second Gauquelin heredity study made in 1976. A total of 18 placements were tested, for example did Sun sign of one = 7th house sign of the other? Did sign of the Sun's house of one = sign of the ruler of the 7th house of the other? For each placement the observed frequency (typically 0.1 per couple) was compared with the frequency in a sample of 2825 randomly matched pairs. None were significant at $p = 0.05$. Confining the sample to couples with 3+ children made no difference.

7.6.1996.1 Did anyone pass the Astrotest and win \$3000?

Rob Nanninga, *Correlation* 15(2), 14-20, 1996, with a comment by Jan van Rooij 21-25.

In May 1994 the Dutch daily newspaper *Algemeen Dagblad* published an article by former astrologer Martin Boot, who argued that astrologers cannot predict. In response the astrologer Rene Jelsma claimed that astrologers can predict. So I decided to resolve this difference of opinion by inviting astrologers to take part in a test. All participants would receive the birth date, time and place of 7 anonymous subjects. They would also receive the subjects' responses to a questionnaire devised by the participants. 5000 Dutch guilders (almost £2000 or \$3000) was offered to any participant who successfully matched all charts to their owners.

More than 70 astrologers showed interest, sending in an average of ten questions for the questionnaire that I combined into a list of 25 that covered education, vocation, hobbies, interests, main goals in life, personality, relationships, health, religion, etc. I also asked for dates of important events, and added 24 multiple choice questions taken from the Berkeley Personality Profile. Eight experienced astrologers checked the result and had no major objections. At their suggestion I added three multiple choice questions covering family background. The seven subjects were born in the Netherlands during 1957-1959, all with birth data supported by birth certificates. Subjects with an Ascendant near a cusp (so a difference of a few minutes in birth time could change its sign) were excluded. As a precaution, the questionnaire and list of birth data were sent to some Dutch skeptics who tried to find the matching pairs. Although one scored three hits, there was no reason to suppose that any of the pairs could be identified using inadvertent cues in the data.

Of the 44 astrologers who took the test, at least half had read more than one hundred charts and were very experienced, while one-third were frequently paid for their services. One quarter were members of NGPA, the Dutch Society of Practising Astrologers. Half expected 100% hits, and only six expected less than 60%, so their confidence was high. But in fact the best astrologer scored only three hits (43%), same as the best skeptic. Half scored no hits, and the average score was 0.75 hits versus 1.00 expected by chance, which was not even in the right direction. There was no evidence that the most experienced astrologers did any better than beginners. The mean agreement on a scale of 0-1 between astrologers was 0.01, essentially zero, almost as if each astrologer had used a random number generator for deciding their responses.

I asked the astrologers what factors might be responsible for the disappointing results. They pointed out that the outer planet positions in the birth charts were very similar (nevertheless the charts showed many differences), as were some of the questionnaire replies (for example all subjects claimed to be reliable workers, but again there were many more differences than similarities), and maybe the questions were not always answered truthfully (but why should anyone lie about their hobbies or the date of their wedding?). Some participants felt they did not receive enough information, but nearly all had received more than they had asked for. So these arguments are unconvincing. Even if all responses including birth data were totally false, this would not explain why the astrologers failed to show mutual agreement.

Some Dutch astrologers explained the results by resorting to the paranormal. They claimed that astrologers can get hits only by using their intuition or by tuning in to the cosmic order, which can be done only during authentic consultations. So as soon as anyone interferes by selecting clients or asking questions, this ability disappears. But clearly the participants did not agree with this view, else they would not have participated. Also their confidence presumably included their confidence in intuition, whose role they would have maximised by their method of working. So the results allow us no reason to suppose that astrology depends on paranormal influences. **Comment by Jan van Rooij** In this test the astrologers were offered such a huge amount of information that success was unlikely, yet that was precisely what they requested. They simply overrated their ability. So their panicky explanations are unnecessary.

Comment This implies they might have succeeded at a simpler task but there is no evidence that any astrologer can do this. Regardless of the amount of information, experience had told them astrology could deal with it – and half of them had expected 100% hits.

7.6.1997.1 Is Mars related to red hair?

Nick Kollerstrom, The Mars-Redhead Dilemma, *Correlation* 16(1), 19-21, 1997.

US astrologers Judith Hill and Jacalyn Thompson (*NCGR Journal* 24-29, Winter 1988-1989) reported that a significant proportion of naturally red-headed people were born with Mars within 30° of the Ascendant. Could this interesting finding be replicated? Here Kollerstrom reviews the original study (pilot & main experiment) and two replications, with these results:

	Sample N	N with Mars rising		% excess	p by chi2
		Observed	Expected*		
Pilot study	100	29	18.1	60	0.005
Main experiment	400	107	72.2	48	< 0.001
US/Canada replication	479	105	86.7	21	0.03
UK replication	473	92	82.9	11	0.27

*Via controls generated by switching birth times

The % excess is much smaller and much less significant for the two replications, which suggests the original finding was a case of "beginner's luck". **Comment** Red hair tends to darken with age and then fade, so redheads tend to be young. Their range of birth years will therefore tend to be small, thus increasing the chance of artifacts. Hill & Thompson declined to circulate their red-heads birth data, so this point remains untested. Françoise Gauquelin in *APP* 6(3), 39-42, 1988 comments: (1) Originally 8 chart factors combined into 30 hypotheses were proposed, all considered to be meaningfully related to red hair. But "with such an accumulation of hypotheses the experimenter is quite certain that some of his predictions will seem successful to a naïve reader". (2) In the article by Hill & Thompson only two of the 30 hypotheses (ie Mars rising and Mars setting) were mentioned, and even then the former orb of 15° had been doubled. (3) These two changes are "ingenuous subterfuges" which makes the apparent success a "post hoc contrived fit". Geoffrey Dean in *Correlation* 16(2), 57-59, 1997 notes that:

Despite the obvious symbolic links between red hair and Mars, red hair is not specifically associated with Mars rising either by modern authors such as Carter, Hone, Ebertin, Parker & Parker, Mann, and March & McEvers, or by traditional authors such as Ptolemy (who if anything associates red hair with Mars descending) and Firmicus Maternus (who says nothing about hair colour, although he does say that Mars as chart ruler indicates red hair, bloodshot eyes,

bravery, envy, gluttony, a monstrous bad temper, falls from high places, and a sudden violent death). More promisingly, Sepharial links red hair with Mars aspects to the Ascendant (but there is still nothing special about Mars rising), as does Robson (but here the hair can also be light or black), while Alan Leo says red only if rising Mars is in Aries or Aquarius, otherwise brown or black – note the disagreement. ... Some 90 years ago the British astrologer Aphorel asked "What is the astrological cause of auburn hair?", see *Modern Astrology* 1907, 4, 100-102 ... Barely two hundred pages later in the same issue (pp.293-296), Alan Leo reported that Aphorel's challenge "has provoked an enormous amount of interest amongst our readers ... [some of whom] went to extraordinary pains to collect data... [however] of the specimens of hair sent in not one was *red*! And, moreover, in comparatively few cases were both time and date given". [Nevertheless he eventually ended up with] 31 redheads, each with a description such as bright red, beautiful red, ugly red, red gold, pale sandy, auburn, chestnut, dark auburn, and magnificent auburn. Several cases include comments about gradual darkening, and in one case dramatic fading: "In childhood, brilliant, shiny, heavy gold hair, real golden ... hair now thin, in comparison, and mouse colour. Why?" (subject was a female aged 31). One case had "red hair, and the temperament usually associated therewith", but this was a male only twelve months old, so maybe he was teething. At publication most of the cases were aged 15-38, mean 27, so the ages at which their hair colour was recorded would be less. ... by my [ie Dean's] calculations the distribution of Mars in these 31 cases, and in the 10 cases that specifically had *red* as opposed to *auburn* or *gold* in the colour description, is as follows:

Placidus house	7	8	9	10	11	12	1	2	3	4	5	6
All cases, N=31	4	2	2	2	2	0	5	2	4	5	0	3
Red cases, N=10	2	0	1	1	0	0	1	1	2	2	0	0

The totals in the rising houses (in bold face) are 5 and 1 vs expectancies of about $31/6 = 5.2$ and $10/6 = 1.7$. No hint of an effect here. [Correlation between 10 *red* and 21 *other-than-red* is $r = 0.31$, $p = 0.32$, $df = 10$]

7.6.2000.1 Making astrological language qualitatively testable

David Brixner. *Astrologische Beratung. Eine qualitative Analyse astrologischer Diagnosepraktiken in der Erziehungsberatung im Vergleich mit den Kategorien des NEO-FFI*. [Astrological consultation. A qualitative analysis of astrological diagnostic categories in counselling compared with NEO-FFI (Big Five) categories] Diploma thesis, Faculty of Social and Behavioral Sciences, Eberhard Karls University Tübingen 2000, 308 pp all in German, 57 references. A look at how chart factors can be described in Big Five terms. But there is no comparison with consultations based on the Big Five instead of on astrology, which would have been useful, and nobody actually completes a Big Five questionnaire.

The author begins by noting that quantitative studies have generally failed to confirm astrological ideas but are not without problems. For example they test parts of charts that are often in conflict with each other, or they test astrologers rather than rules of interpretation, or they



make astrology testable in ways that make unjustified assumptions about what a chart factor is supposed to mean. In technical terms:

quantitative research designs can clarify validity questions about astrology only if they properly operationalise astrological concepts [ie make them measurable], for example when addressing them in a questionnaire (p.35).

Or more simply, how can the many complex components of a chart interpretation be made accessible to research? The author suggests qualitative research is needed to establish the extent to which chart factors share the same language as the criteria chosen to test them, which represents an important change in focus:

Here the focus is not on the statistical quantitative verification or falsification of a hypothesis but on whether the selected criteria are appropriate in the first place (p.36).

He notes that astrological counselling practices tend to be neglected but are an ideal area for comparing astrological interpretations with the Big Five model of human personality (chosen because, unlike tests that focus on particular areas of personality, it looks at the whole person – personality, relationships, interests, work performance). So in principle the whole chart can meet the whole person to see if they share the same language.

To put his ideas to the test, Brixner worked with audio and video recordings of three very experienced DAV-certified astrologers interpreting two juvenile charts (male 8 years, female 14 years) for a parent. Juveniles were chosen because they would normally be absent, thus avoiding the possibility of imposing constraints on the interpretation. In each case Brixner and the juvenile's mother were present. He used recordings rather than written reports because they directly accessed the interpretation of each factor (which is the target here) rather than

their synthesised meaning when reports are written up. After each interpretation he interviewed the astrologer to clarify which chart factors were considered important.

All astrologers were offered full payment for about two hours' work but they insisted on waiving all charges or giving a 50% discount, in which case they were paid DM 250, then worth about \$140. They were told that it was an investigation of chart interpretation, but not that a coding in Big Five terms was involved.

All sessions were transcribed, all statements were coded to indicate which chart factor they related to, and if possible which end of a Big Five dimension (+ or -) they best fitted. After a computerised content analysis of the resulting enormous files, the number of items on which all astrologers agreed for both charts (total 20 vs 100 less agreeing items) were:

Astrologer >> Chart is >>	--1--		--2--		--3--		From pages 66-67 Big Five dimension end
	m	f	m	f	m	f	
10th house	0	1	2	0	1	0	Extraversion +
Jupiter	6	0	1	0	1	2	Extraversion +
Leo	0	2	1	2	0	2	Extraversion +
Mars	2	0	2	1	1	3	Extraversion +
Mercury	4	0	0	2	0	2	Extraversion +
Sagittarius	0	2	0	2	1	1	Extraversion +
12th house	0	2	1	0	0	2	Extraversion -
Pluto	0	3	11	2	0	2	Neuroticism +
Scorpio	0	4	2	1	0	1	Neuroticism +
Uranus	3	0	3	2	1	0	Neuroticism +
Mercury	1	1	2	0	0	2	Openness to Experience +
Neptune	3	0	3	1	0	1	Openness to Experience +
Sagittarius	0	3	1	2	0	4	Openness to Experience +
Uranus	2	0	4	0	0	1	Openness to Experience +
Gemini	1	2	2	0	1	3	Openness to Experience +
Pisces	1	1	6	0	1	0	Conscientiousness +
Mars	0	1	4	3	0	2	Conscientiousness -
Saturn	7	5	3	5	2	2	Agreeableness +
Neptune	1	0	0	2	0	1	Agreeableness -
Uranus	4	0	1	1	1	0	Agreeableness -
Total	35	27	49	26	10	31	Mean 3.0 per end per chart

The author concludes that the results show:

no clear assignments to the Big Five dimensions. Thus the listed astrological factors can relate to more than one Big Five dimension. But many factors have interrelated meanings, for example Jupiter, Sagittarius and 9th house are sufficiently similar for some astrologers to use them interchangeably, and at this level the assignments become clearer (p.68). Nevertheless not all are clearly assigned to each other (p.90).

He suggests that the results could be used as the first step towards creating an "astrological Big Five" where the empirical components are replaced by astrological ones, so that each chart factor could be expressed in Big Five terms that horoscope owners could relate to. But he does not discuss whether the Big Five assignments he has achieved are sufficiently promising for them to provide acceptable criteria for quantitative tests of astrological factors.

Comment Nor does he point out that the Big Five dimensions were established over the years by many independent researchers making many tests on large numbers of people, so they represent reality, whereas astrological factors were not established by anything (see Chapter 3) and therefore represent only speculation. To argue that tests will be inappropriate unless the criteria used share the same language is no more than such tests have always required. Indeed, Keith Burke in his 2012 PhD thesis *Big Five Personality Traits and Astrology* had noted that an exact match in meaning existed between the Moon in the four elements and four of the Big Five dimensions. But it offered no advantage – tests of its reality using 192 subjects gave only chance results and three elements were in the wrong direction, see 2.3.

Nevertheless Brixner's study sets a benchmark for qualitative studies. As a bonus it includes every (uncoded) transcription, which collectively fill two-thirds of its pages and illustrate what a qualitative approach can entail. For example here is the interview with one astrologer (pp.148-150) that is *one eightieth* of the total transcriptions, further abridged to 40% of its length to remove noise including repetitions, ums and ahs. A=Astrologer, B=Brixner:

A: Ok, Mr B, now you.

B: What is important in this horoscope? If you could say "the theme is here" (points to chart) what would it be?

A: First, this axis 3-9 and then Chiron, because the chart has a Virgo ascendant, and because Chiron has something to do with injuries and the reverse of talents. So you transform your own experiences into skills, which has something to do with the professional goal. That was the first main focus. Then I looked for the inner potential. Very often it's a 4th house matter, but for me it starts with the axis of the Moon's Nodes, here Taurus-Scorpio, so access to one's talents is blocked by unconscious issues that are in the family, which may have something to do with experiences in childhood.

B: So that's the way it was. Now the annual theme, was that based on transits?

A: No, on a combination of three techniques. First, the solar return, showing "What do I want to integrate into my consciousness this year?" Here she has a Sagittarius ascendant, so again the topic is Jupiter, which is directly at the IC or "Father point". The Sun is in 5th house, which is your own identity and creative potential. The most activated planet is Jupiter in 6th house, so it has something to do with the life's work. **B:** Yes.

A: Then come the progressions (one year, one day) and there you look mainly to the Moon, which is going through Virgo, asking "what's wrong with me?", and into Libra and 2nd house, so it's all about the relationship with one's talents, the ability to love oneself. Progressed Sun is on Chiron (those old wounds and injuries again), symbolising that something can be healed or cleaned. **B:** Hmm.

A: And then come the transits but only from Jupiter and Saturn. Three times Jupiter-Mercury, which is talking, writing, meaning, creative expression. Saturn is about the spiritual life and therefore "what am I here for?". It's in 9th house, so again Jupiter. That's where everything condenses. And on this chart in red are the solar return planets, in blue are the progressed planets, and in green are the transits. So on this piece of paper you have everything in there.

B: Good (checks his interview guide to make sure no questions are left: 12 seconds). Were you distracted by the camera or by me? **A:** It was not a problem for me.

Not every astrologer uses Chiron, in which case their answers to these questions would be different. They would be a fruitful source of hypotheses to be tested quantitatively, but until tested they would merely illustrate "astrology seems to work" without explaining why.

7.6.2002.1 Parent-child comparisons N=1250 pairs

Bernadette Brady, The Australian parent-child research project, *Correlation* 20(2), 4-38, 2002. Summarised as The Australian Family Astrological Correlations Project, in *Astrological Journal* 44(2), 18-22, March/April 2002, in which Brady explains: 'When a child was born into my family, where others would say "Oh look, he has his mother's eyes", I like most astrologers would say "Oh look, he has his mother's Moon", or some other astrological statement. However, given the many ways in which a chart can relate information, there is a good chance that we could take two random charts and by chance alone find some sort of correlation between them. ... So my quest was to see if what astrologers see as an astrological family resemblance is a real phenomena or can it be dismissed as mere chance.'

To find out, Brady collected data from Australian astrologers and students. After fifteen years she ended up with 454 fathers and 796 mothers born mostly 1935-1960 in northern and southern hemispheres, plus 633 sons and 617 daughters all born in Australia mostly 1945-1990, of which 581 were first born. All birth times were recorded within 10 minutes and none were rectified. For controls she used either shuffled data or 500 random births 1900-1960 in Australian locations. Comparisons involved one parent vs one child, and vice versa, so that:

For each parent there were 2 comparisons (vs sons, vs daughters).

For each child, each first born, and each not first born, there were 2 comparison (vs fathers, vs mothers).

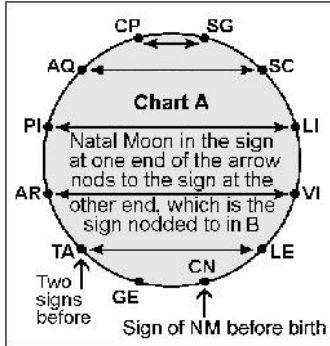
Total for each link tested = 2 comparisons x (2 parents + 2 children + first borns + not first borns) = 12 tests.

The traditional links tested were essentially all possible combinations of:

Planets – angular planets orb 9° for parents 4° for children.
– planets in own sign.

Signs – sign ruled by the angular planet.
– sign ruled by Sun, Moon, Ascendant.
– sign ruled by X, where X was any planet conjunct the Moon orb 9°.
– Sun, Moon, Ascending signs.
– Sun, Moon, Ascendant if in the sign to which the parent's Moon nods (see below), chosen because it "fitted the old lunar astrology better than the logical Greek solar model currently in use" (p.34).

	AR	TA	GE	CN	LE	VI	LI	SC	SG	CP	AQ	PI
Old	MA	VE	ME	MO	SO	ME	VE	MA	JU	SA	SA	JU
New	MA	VE	ME	MO	SO	ME	VE	PL	JU	SA	UR	NE
Exalt	SO	MO		JU		ME	SA					VE



In chart A find the sign of the closest New Moon before birth. Move backwards two signs to locate the first nodding, which nods to the sign in front of the New Moon sign, then locate the others as arrowed in the diagram and select the one containing the natal Moon sign. The other end points to the sign nodded to in chart B. Here the New Moon before birth is in CN, so natal Moon in CP through TA would nod to SG through LE in chart B, and vice versa. If chart A's natal Moon is in either the New Moon sign or the sign before (here CN and GE) no nod to chart B is possible. This applied to 27% of father and 25% of mothers.

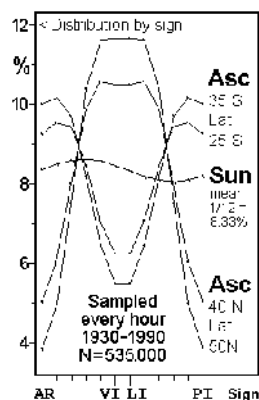
Comment Brady relies on 2x2 chi-squared tests to select the most promising outcomes. For example a test of whether parents and children shared the same angular planet (orb 9° for parents and 4° for children) gave these results:

	454	796	633	617	581	669
	Fathers	Mothers	Sons	Daughters	1st Born	Later Born
Observed hits *	62	111	84	88	85	
Expected hits	58	110	84	84	75	92
Difference % of expected	+7	+1	+6	0	+17	-8
Chi-squared df=1	0.22	0.14	0.34	0.00	2.13	0.66

Case contains X? (here the chosen link):	Yes	No	Total
Group 1 here the experimental sample	a	b	a+b
Group 2 here the control sample	c	d	c+d

for which the calculation of chi-squared and p requires all four values (ie abcd). But inspection of Brady's results shows that chi-squared is calculated incorrectly as $(a-c)^2/c$, which ignores b and d ; the test's assumption of independence is often violated (for example sons are not independent of first borns); the test is not valid when empirical expectancies are used (it does not allow for their sampling error); and her p values are not corrected for the number of tests;

all of which inflate significance and the seeing of non-existent effects. On p.11 the Yates correction and the correction for continuity (which are the same thing) are treated as if they were different; and her control groups are most likely an inadequate control for Ascendants:



Expectancies for the Ascendant are very sensitive to birth latitude. Unless the control sample is closely matched to the test sample, the expectancies thus derived will be misleading. The expectancies shown here differ from Brady's by an average of 1.0% on the vertical scale, enough to generate significance where none actually exists.

A word on **utility**. Signs are the most disconfirmed factor in astrology, so one could arguably discount any approach based on them other than as an exploration of self-attribution. Even so, Brady's results show that the mean proportion of parents or children who actually have one of the tested links is about 10%, which therefore excludes about 90% of cases. Obviously no working astrologer will be interested in results that apply to only 1 in 10 clients even if the results meant something, which (since 1 in 10 is expected by chance anyway) is doubtful.

Similarly Brady's best results (for Moon noddings p.23) may seem convincing – their reported (albeit invalid) chi-squared values give $p = 0.000,002$ and 0.0009 – but when the results are correctly calculated and corrected for the number of tests, nothing is even marginally significant (no $p < 0.2$). Also their r effect sizes for Sun sign and Moon sign noddings for fathers and mothers combined are only 0.026 and 0.047, so even these cases are of no practical use. Especially as they failed to replicate in the Gauquelin sample (nothing was significant, p.24).

Despite all this we might still applaud Brady's hard work in implementing this study, which was clearly not well served by the expertise of *Correlation's* referees nor by the editorial claim that the results are "a potentially important finding for astrology" (p.3). Which may explain why an expanded version of these comments sent to the *Correlation* editor Pat Harris for publication received no response despite several repeats. For a déjà vu see 7.4.2006.1.

7.6.2006.1 Picking own profile with astrology / MBTI / Big Five

M Lennox, PhD thesis, California Graduate Institute 2006. The author describes himself as a trained astrologer.

The author administered the Myers-Briggs Type Indicator and the Big Five Inventory to 30 people (15 female) mean age 45, range 23-68, all with recorded birth times. All sun signs were represented. After calculating their charts he generated interpretations based on Sun through Mars, and Ascendant, by sign, house, and aspect. Each subject received their own chart interpretation, MBTI profile, and Big Five profile, plus four more of each chosen at random (each type was identified but not which was theirs). Care was taken to make sure that none of the four chart interpretations duplicated the sun sign or sun element of the authentic chart. Each subject rated each of their 15 profiles on a 10-point scale from 1 (very unlike me) to 10 (very like me). The mean ratings and standard deviations were as follows:

	Authentic profile			Four others			p of difference
	Mean	sd	N	Mean	sd	N	
Chart interpretation	7.53	1.21	30	6.73	1.71	120	0.041
MBTI profile	6.63	2.52	30	4.99	1.14	120	0.0000004
Big Five profile	6.67	2.60	30	5.17	1.35	120	0.00002

In each case the authentic profiles were significantly preferred to random profiles. Also the authentic chart interpretations were preferred to the authentic MBTI profiles and Big Five profiles, albeit not significantly ($p = 0.08$ and 0.11 respectively). The author attributed at least some of the apparent preference for chart interpretations to their more personal nature:

He notes that the astrological profiles provided specific, individualized, personal comments, whereas the MBTI and Big Five profiles were based upon standardized, computer reports that were more general in their descriptions of personality features. When he prepared the astrological reports he did not personally know any of the participants, and he was also blind

to the results of the MBTI and Big Five tests. So he sees the success of these participants in identifying their own astrological profiles ahead of the MBTI and Big Five profiles as a clear challenge to conventional concepts of personality assessment (pp.91-92).

Comment But look at the above table. Wrong chart interpretations (6.73) are preferred to authentic profiles (6.63, 6.67) so astrology cannot be responsible for the supposed superiority of chart interpretations. The difference between 6.73 and wrong profiles (4.99, 5.17) could reflect the effect of astrological belief, in which case the difference (mean 1.65) reduces authentic charts (7.53) to below the authentic profiles. Unfortunately the author fails to consider artifacts like the Barnum effect even though it could easily explain the preference for wrong interpretations. Nor does he consider sun sign cues that, given his care to exclude same sun signs from the controls (ie precisely the opposite of what is required), could equally explain the results. His failure to observe due precautions might cynically be seen as his astrology training providing protection against the possibility of negative results.

7.6.2007.1 Angular planets and 500 pedigree dogs

S Fuzeau-Braesh and J-B Denis. An empirical study of some astrological factors in relation to dog behaviour. *Journal of Scientific Exploration* 21(2), 281-293, 2007. Reprinted in *Correlation* 25(1), 23-28, 2007 and summarised in *Astrology Off the Beaten Path: A Scientific Study of Planets and Personality* 2009:67-72, both without the JSE editor's cautionary comments. A genuinely pioneering study that deserves summarising in detail. But first some background:

In his 1990 autobiography *Rebel with a Cause*, Professor HJ Eysenck notes that if E and N are major dimensions of personality with a biological basis then they should be apparent in both human behaviour and animal behaviour. Nevertheless:

for many people it sounds almost absurd or indeed insulting to talk about "personality" in animals, though no one familiar with dogs, cats, horses, or indeed rats, and even lowlier animals would doubt that there are great differences in behaviour between them. ... one has to be very cautious about extrapolating from animals to humans (or vice-versa!) but the existing literature leaves no doubt about the considerable degree of overlap (p.203).

Most of the work by Eysenck's associates had involved rats, initially looking at the difference in N between emotionally reactive rats and non-reactive rats. They also studied monkeys:

Rhesus monkeys were observed on a regular basis for about two years, and their behaviours noted. The resulting ratings were then factor analysed, and three major factors extracted which could reasonably be regarded as similar to psychoticism, extraversion and neuroticism. Characterized by their behaviour, animals tended to be either aggressive (P), sociable (E) or afraid (N). Indeed, these three seemed to be the only fundamental ways in which people or animals can interrelate socially, and from a purely logical point of view, one might have anticipated the emergence of these three factors (p.202). There is now ample evidence ... that these three major dimensions [P,E,N] emerge from practically any large-scale analysis of traits published in the literature (p.199).

With this in mind we can now move to the present study. Its authors looked at pedigree dogs, which (in contrast to ordinary dogs) are ideal for astrological study:

Pedigree dogs were used because breeders are always particularly attentive to the conditions of birth, given the potential value of the pups. ... Purchasers frequently want to know the time of birth, the order of births in the litter (was my dog first, second, or last? and so on), how the pup behaved in its first few days and weeks of life. As the pups must live with their mother and cannot be sold until they are two months old, their behaviour is very well documented over this period. Every breeder of pedigree dogs keeps a very precise diary, where all this information is carefully entered for each animal, the individuals being identified either by colour differences (zones, patches, spots and so on) or in the case of uniform coloration, by means of a cropped area of the coat.

It was decided to use different breeds of pedigree dogs to prevent any bias linked to a given breed. They were: Bearded Collie, Belgian Shepherd, King Charles Spaniel, Chihuahua, Coton of Tulear, French Bulldog, German Shepherd, Labrador, Lhasa Apso, Malinois, Poodle, Sharpei, Shitzu, Tibetan Spaniel, and Yorkshire Terrier. Geographically, the kennels were all in the Paris area to ensure easy contact with the breeders. The breeders who agreed to participate had no special knowledge of, or interest in, astrology. Over a period of five years, a total of 100 litters were investigated, from two to eight pups in each, for a total of 500 pups. Twelve breeders participated (p.282). The age of the dogs, two months at final evaluation, was considered satisfactory on the one hand because of the difference between the lifespan of dogs and of humans, and on the other because all breeders agree that behavioural structures of pups are formed very early in the context of the social group consisting of the bitch and her litter (p.283). ... the intervals between the birth of successive pups can vary between 15 minutes and two hours. This factor [which means appreciable differences in Ascendant and MC for each pup] makes dogs particularly appropriate for this study (p.284).

The authors grouped the descriptions in breeders' notes according to three traits related to E:

Active (22 descriptions such as active, bold, expressive, frisky, responsive).

Dominant (18 descriptions such as aggressive, determined, greedy, sociable).

Reserved (16 descriptions such as aloof, dominated, timid, touchy, shy).

And three traits related to N (more on this later under Comments):

Emotional (Affective) (5 descriptions: affectionate, likes petting, confident, gentle, tender).

Nervous (9 descriptions such as easily frightened, nervous, sensitive, restless, whiny).

Stable (18 descriptions such as calm, demonstrative, independent, not shy, quiet).

The authors calculated the frequency for an angular SO through PL (yes or no, orb 10°) for dogs with each trait (+ or -). The only significant results for 10 planets x 6 trait lists = 60 combinations were for SO and JU vs E *Dominant*, these results are from their table (p.285):

Angular?			----- Extraversion -----						----- Neuroticism -----					
y/n		N	Active		Dominant		Reserved		Emotional		Nervous		Stable	
			+	-	+	-	+	-	+	-	+	-	+	-
SO	y	107	56	51	42	65	24	83	43	64	7	100	42	65
SO	n	393	181	212	78	315	113	280	151	242	36	357	140	253
JU	y	109	58	51	44	65	20	89	48	61	8	101	38	71
JU	n	391	179	212	76	315	117	274	146	245	35	356	144	247

**	y	104	50	54	29	75	27	77	42	62	9	95	37	67

** Mean of ten planets. Obs y = 104. Exp = 500 x (4x2x10/360) = 111

The authors do not give *p* values and effect sizes for each of the 60 comparisons, but for SO and JU they can be calculated from the above 2 x 2 groups (as in 7.5.1992,1) and are:

Dominant	+ Yes	- No	Total	Dominant	+ Yes	- No	Total
SO angular	42	65	107	JU angular	42	65	107
SO not angular	78	315	393	JU not angular	78	315	393
Total	120	380	500	Total	120	380	500

$p = 0.00005$ $\phi = 0.186$

$p = 0.00001$ $\phi = 0.202$

More in Comment 1. The authors note that human births with SO and JU in angular positions:

are generally described [by astrologers] as charismatic, dominant, strong, sociable and influential in a group. This is obviously comparable with the canine equivalent where the corresponding pup holds a dominant position among its peers during its first two months of life. It is always the first to eat and this is accepted by the entire group, and it will push the others away with impunity to get the attention of human attendants or just to move around, breeders report. This parallel is remarkable and cannot be due to chance (pp.287-288). [Finally the authors conclude that their study] demonstrates that some relationships exist between [angularity at the] birth of dogs ... and independently assessed behaviour traits (p.287). The similarity between observations of dogs and human astrological descriptions can only be explained by the existence of a physical causal effect, so far unknown (p.289).

Unusually for a *Journal of Scientific Exploration* paper, it was followed by editorial comments, on these three points: **(1)** Is there any independent data to justify applying to dogs a scheme developed for humans? After all, the scheme is only one of many proposed by astrologers. **(2)** The grouping of breeder descriptions would have been better made by disinterested outsiders to avoid experimenter bias. **(3)** In tests of human astrology some astrologers have suggested not using young subjects because traits have not had enough time to be clearly established. Might not the same concern apply here? (pp.292-293).

Comment 1 The authors' homework would seem to adequately answer points (1) and (3). But point (2) remains a serious problem in view of similar problems uncovered in SFB's study of twins, see 7.6.1992.3, and the problems raised by the referee in SFB's study of human sociability, see 7.1.1997.2. For example, following Eysenck, why is *touchy* rated as E- and not N+, *restless* as N+ and not E+? Do litters of 2 or 3 pups provide enough variety for accurate descriptions? Especially in view of recognised differences among the 15 breeds tested.

There are severe inconsistencies. **(1)** SO and JU are very significantly linked to E+ *Dominant* ($p = 0.00005$, 0.00001) but not to E+ *Active* ($p = 0.30$, 0.21). Restrictive SA shows no significant links with E- *Reserved* ($p = 0.80$) or N- *Stable* ($p = 0.38$). Sociable VE shows no

significant links with E+ *Dominant* which includes *sociable* ($p = 0.47$). Shy/worrying NE shows no significant links with N+ *Nervous* ($p = 0.68$). And so on. (Here the links between planets and traits are from Charles Carter's *Essays on the Foundations of Astrology* 1947/1978: 21,45.) (2) Although p values for SO and JU vs E+ *Dominant* are astonishingly significant, the p values for the other 58 combinations are no better than chance, which should not be if genuine links matching tradition existed between angular planets (not just SO and JU) and E and N. Nor would their effect sizes be generally so small (means +phi 0.047 -phi -0.041).

Conclusion: The most likely explanation for the above inconsistencies is cherry-picking. The inconsistencies do not deny the ingenuity of the authors' study, but they could have been avoided by factor analysis of the breeders' descriptions, by blind allocation, and by dividing the sample in two to see if the results replicated. None of this is difficult. It could still be done.

Comment 2 There have been no studies of animal births similar to the present one, so it was truly pioneering. One that came near was Charles de Herbais de Thun's 60-page 1938 book *Astrologie Animale*, which is largely a detailed count by year, sign, house, aspect, angularity of the birth charts in David Hollins's 150-page 1915 book *Horoscopes of 100 Great Horses*. De Thun's main aim was to uncover *les Règles de vitesse* (rules of speed). For 100 racehorses born 1889-1914 his results suggested that the planets of speed were MO, ME, MA, JU, UR. But in the 70 timed cases their mean number was 8.20 vs 8.25 for non-speed planets. His final rules for speed are based on allocating a specified number of points for each planetary sign, house, aspect and angular position. He tests them on eight horses born 1937 in Belgium, and on a few cattle, dog, and goat races, with mixed results (pp.55-58). He concludes that, despite the inadequacy of his brief study:

it is certain that a precise documentation of animal races would establish astrological rules of interpretation, which would render a precious service to animal breeders. ... remember it is essential to record exact birth times (p.58).

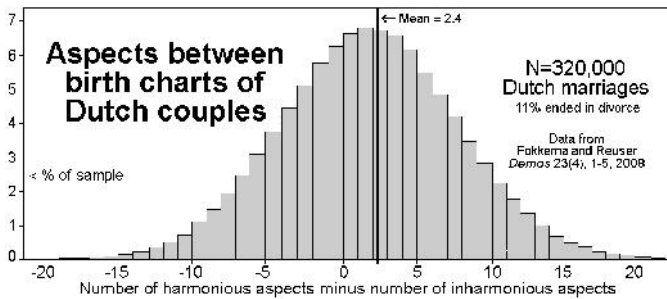
Gerald Baron (*The Crowd Chooses* 1976) analysed the astrology of 14,503 horse races in Toronto 1966-1974 with no result significantly different from that expected by chance with such a large sample. Donald Bradley (*Picking Winners* 1954, 60 pp) sidesteps the problem by relying on horary. Nick Kollerstrom (*Correlation* 27(2), 39-48, 2011) analysed 2318 mating events from a Newmarket UK stud farm 1986-1999, and found a lunar wave of amplitude 7% peaking at Full Moon. This was in addition to the dominant three-week estrus cycle, so it "could be large enough to be of practical relevance" (p.39). It may of course merely reflect a moonlight effect rather than an astrological or lunar effect, in the same way that plant, insect, marine, and some animal life show a direct biological effect of moonlight (an area generally with a substantial literature, see 8.5 and Peters and Ball, *Reproduction in Cattle* 1987:40). Kollerstrom did not study planetary effects. For directions at birth of kittens see 7.4.1983.1.



7.6.2008.1 Divorce and 320,000 marriages

T Fokkema & M Reuser, *Demos* [Bulletin of the Netherlands Interdisciplinary Demographic Institute], 24, 1-5, April 2008. **Comment** This study was cited by critics of our first edition claiming we knew of it but had ignored it, which to them suggested bias. But it was a pilot study awaiting a follow-up, so we too were waiting. But there were no funds for a follow-up, so this summary is of the pilot study..

We tested the claim that married couples with more inharmonious aspects (–) than harmonious aspects (+) between their birth charts would have a greater chance of divorce. Our sample of 320,000 marriages was a 10% sample of all Dutch marriages from the Central Bureau of Statistics. It included date and country of birth of both partners, date of marriage and, where applicable, date of divorce. But not birth times, so we used noon for the planetary calculations.



Results The Western zodiac signs and Chinese animals gave insignificant results. But aspects gave a different picture. The distribution of the difference in numbers (harmonious aspects minus inharmonious aspects) for the entire sample was notably symmetrical. Owing to the large number of aspects between charts, the spread on the horizontal axis is also large, but the mean is a surprising +2.4 compared to an expectancy of 0.0. But see Comment below.

The authors take the above results and provide further analyses showing that the risk of divorce increases as the proportion of inharmonious aspects increases. For example 46% of couples with a surplus of 12 or more inharmonious aspects were more likely to divorce in the first seven years of marriage. Was it support for astrology? **Comment** No, because (1) The authors include aspects between outer planets, hence the high counts. (2) They assumed the + and – counts should be equal. But all conjunctions between the same outer planets, that is the couples' Jupiters, Saturns, Uranuses, Neptunes, and Plutos (which couples similar in age will tend to have) are counted as harmonious, whereas all oppositions between the same planets (which only couples very different in age, like 120 years for Pluto, will tend to have) are counted as inharmonious. That the average is positive (+2.4) is therefore unremarkable. A control group is essential, but none was used, which means that the results prove nothing. No follow-up was possible due to a lack of funding. A pity our critics missed these problems.

7.6.2009.1 ME-NE aspects and memory recall in 69 subjects

Alison Chester-Lambert, *Correlation* 27(1), 48-58, 2009. The author is a practising UK astrologer.

Mercury symbolises the mind. Neptune symbolises imagination and lack of order. Therefore a Mercury-Neptune aspect in the birth chart should make it difficult to memorise things. To test this idea the author and three colleagues in different parts of England collected a total of 69 subjects aged over 16 and tested their memory recall in the workplace of each subject. The subjects had diverse educational, academic and social backgrounds from students to office managers and entrepreneurs, but age and gender are not reported and are effectively ignored.

The test consisted of four pages of A4 stapled together. The first was blank to prevent advance reading. The second contained 20 words taken from the 220 most frequent English words, all of four letters so their uniform size and high frequency reduced their distinctiveness as an aid to recall, all chosen to avoid easy grouping as an aid to recall, and typed in two columns.

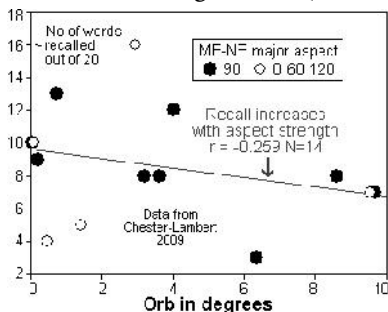
down, said, have, them, well, make, long, went, came / were, help, cold, take, just, blue, very, from, into (the author's list contains only the above 18 words, not 20 as stated in her text).

Each subject had to learn the words for one minute while being timed. They then turned to the third page containing seven simple sums-with-answers such as $1+3=4$ and $8-3=6$ (to be marked correct or incorrect) that took about 30 seconds to complete, this being the time required for information to move out of short term memory. When finished they turned to the fourth page and wrote down as many words as they could remember in one minute, finally adding their birth place, date and time. Subsequently 22 of the subjects were found to have a major or minor Mercury-Neptune aspect in their computer-calculated (*Solar Fire*) birth charts. The author does not state the orbs she used but inspection of the results for the 22 subjects in her Appendix B suggests something like 10° for major and 5° for minor, which are slightly larger than normal presumably to give sufficient numbers. Here are her test results:

ME-NE aspect >	Yes	No	
Mean words remembered	8.27	6.66	
Standard deviation	2.93	2.86	p of difference
Number of subjects	22	49	by t-test 0.034

The difference is significant but in the wrong direction. Nevertheless the author sees it as supporting astrology because the wrong direction may simply be because Mercury-Neptune subjects have been accused of, say, daydreaming at school, which they have then overcome by learning how to memorise better.

Comment Serious defects are the long time allowed for checking the sums (a numerate person could do them in <10 sec), and the effects of age (which is substantial) and mood on memory recall, which the author does not mention or test for. Nor did she apply controls or test the effect of a change in orbs. In particular she did not measure the correlation between the number of words recalled and aspect exactness, which allows a useful check on the main finding because the correlation between orb and the number of remembered words should be positive (larger orbs = weaker aspects = more words remembered). But it is negative albeit nowhere near significant ($r = -0.259$, $p = 0.37$). And the actual results plotted here for the 14

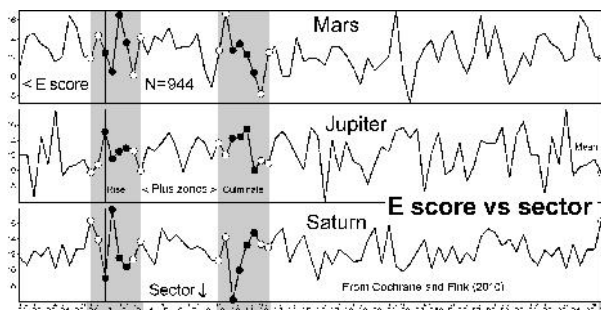


subjects who have major ME-NE aspects are all over the place, with none of the clear trend we might expect given the huge range in recall (3 to 16 out of 20). So her results seem more likely to reflect uncontrolled external factors than anything astrological. Finally the author feels it would be interesting to repeat her experiment with an IQ test, so that different levels of cognitive activity could be related to birth charts. Such a relation has been sought but has not been found, see 7.6.2013.1 and relevant cases in 8.10.1.

7.6.2010.1 Extraversion and Mars/Jupiter/Saturn effects

David Cochrane and David Fink 2010. www.Astrosoftware.com/articles/. If planetary effects apply to ordinary people, not just eminent professionals, extraversion scores should be high for Mars and Jupiter in plus zones, low for Saturn.

During 1985-1996 the Eysenck Personality Inventory was administered to students at three colleges in north eastern USA, who later provided their date, time and place of birth. A total of 982 students provided complete data, of which 38 with unsatisfactory lie scores were rejected. Median age was 21 years, 60% were female. The precision of birth times was not reported.



Mean E scores by 72-sector position. Closed circles mark the middle half of plus zones, open circles mark the remainder. Average score for Mars and Jupiter closed circles (13.48, sd 4.02, N 200) was significantly higher than the average score for Saturn closed circles (12.78, sd 4.30, N 74) $p = 0.049$. A weighted astro score vs E gave $r = 0.079$ $p = 0.015$ explainable by weighting choice and by planetary self-attribution (which the authors did not control for). Mars and Jupiter scores are not clearly higher in plus zones than elsewhere, and Saturn scores in plus zones include both high and low scores. So the results are inconclusive.

Comment For E score vs age the correlation (not calculated by the authors) was about 0.135, better than astrology, and consistent with the 0.14 observed for E and N vs age in 8.9.2.2.



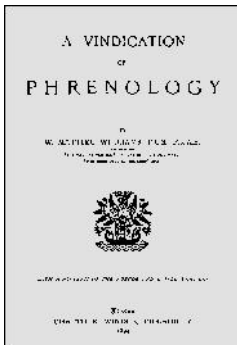
7.6.2012.1 A sober warning from phrenology

Geoffrey Dean, *Skeptical Inquirer* 36(6), 30-38, 2012. How experience without due scientific caution led millions of people to wrong conclusions. A sober warning for astrology. The quotation from Williams (1894) has been added.

Today phrenology ("head reading") is effectively dead. But in the 19th century it was influencing all levels of Western life and thought. In Britain, Europe and America its influence was felt in anthropology, criminology, education, medicine, psychiatry, art, and literature. In France it eroded established power and led to wide social changes. In

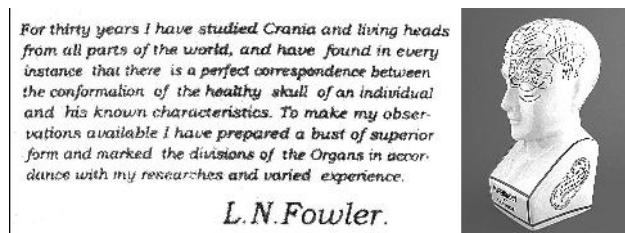
In those days the workings of the brain were largely unknown. The idea of the four humours was still popular, as was bloodletting. Traits of ability and character were held to be equal in all men at birth and were determined by upbringing. To claim otherwise was a crime against morality and God. But phrenology *did* claim otherwise – traits were innate, localised in the brain, and measurable by head shape. What was once a mystery was now as an exact science. If true it promised to revolutionise just about everything.

former chemist and later science writer W Mattieu Williams could publish *A Vindication of Phrenology*, whose 428 pages were devoted to:



But nowhere in its 428 pages was there a single empirical test. For the author his experience was more than enough, which viewpoint was not overturned until the rise of experimental psychology. Thus thirty years later US psychologists Cleeton and Knight (*Journal of Applied Psychology* 8, 215-231, 1924) read physiognomy and phrenology books to find out

For thirty years I have studied Crania and living heads from all parts of the world, and have found in every instance that there is a perfect correspondence between the conformation of the healthy skull of an individual and his known characteristics. To make my observations available I have prepared a host of superior form and marked the divisions of the Osseous in pecor-



201 correlations, 4 were significant ($p = 0.04$) vs 6 expected by chance. The mean correlation was a useless 0.004. Phrenology was thoroughly invalid. So how could it happen?

To millions of people phrenology had been so fashionable and so satisfying,

7.6.2012.2 Interchart contacts in synastry N=137+227

The authors begin by noting what other authors have noted:

There are, on the one hand, many (subjective) experiences of evidence [from] traditionally handed-down rules of interpretation, of which some have been used successfully for hundreds of years. And, on the other hand, almost every attempt to prove these rules has statistically failed to date (p.826).

Critics explain the difference via hidden persuaders. But not so fast, say the authors. Those failed attempts focused on astrologers interpreting charts for clients, so there is a problem:

The affirmation by a client that a horoscope interpretation is appropriate and consistent meets no reliable criterion for the validity of the astrological hypothesis (p.826). [that is, it is too subjective and is conducted without controls].

To overcome this problem they suggest a new research design based on interchart contacts or what they call *astrological resonance between friends*. The problem is overcome because friendships either exist or they don't, assumptions other than astrological ones are not required, and the usual sociable variables can be ignored. In this case their new research design was:

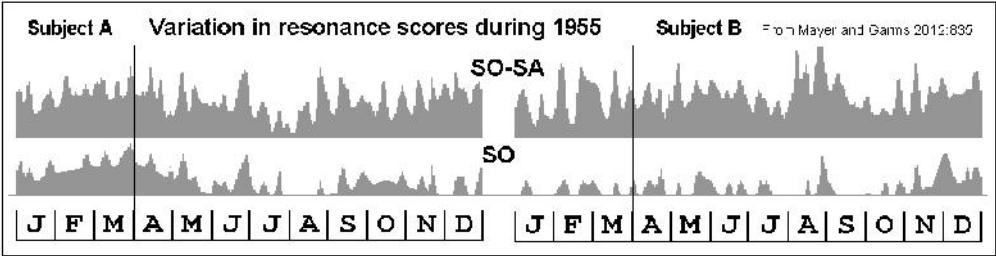
Two people related by a strong friendship will have a high resonance with many interchart aspects, whereas a weak friendship will have a low resonance characterized by relatively few interchart aspects (p.828).

To test this design they collected two samples of friendships, the first via questionnaires distributed among their acquaintances, the second via the internet. Subjects had to list their friendships (no relatives) with dates of birth, sex, and their intensity. The authors felt that bias due to astrological knowledge was unlikely but included questions to assess it. All subjects knew their own birth times but not those of their friends. The two samples were quite similar:

	Questionnaire	Internet
Number of subject	117 (72% female)	227 (74% female)
Mean age in years	41.6	39.1
Mean friends/subject	8.65	7.26
Intense friendships	52%	56%

The resonance score for each subject/friend pair was determined by the number of interchart planetary aspects (0°, 60°, 90°, 120°, 180°) rated by orb, where 0° scored 100 points falling linearly to 5° = 0 points (so 2.5° = 50 points). To allow insight into what was happening the planets were systematically varied as shown below. Key: SO-SA means SO through SA. Planets beyond SA were excluded (too unspecific) as was MO for friends (no birth time):

Test	Subject	Friend
1	SO-SA	SO-SA no MO
2	SO-MA	SO-SA no MO
3	SO-SA	SA
4	Most resonant of SO-SA	SO-SA no MO
5	SO-SA	Most resonant of SO-SA no MO



These examples for Subject A and Subject B show how resonance scores can vary markedly with time in different ways depending on the subject's birth data. The top plot shows the total score for SO-SA. The bottom plot shows the contribution from SO. The plots suggest that a person born at the end of March 1955 would have a stronger chance of friendship with A than with B, subject of course to the decisive verdict of their actual interchart contacts.

Data analysis consisted of comparing means, sds and Ns in a standard *t*-test to test the null hypothesis that the resonance between friends is no more than expected by chance. But how to determine the resonance expected by chance? The authors reject the common approach of simply shifting birth dates because:

In our opinion, this method is not suitable ... because it assumes a homogenous astrological time line ... [which] is not the case. ... That is to say, every point on the time line has its own resonance value in relation to every other point ...

which exhibit complex temporal dynamics resulting from the planetary revolutions (p.834) [that is, we cannot assume that shifting birth dates is a well-behaved linear process when it could be as spiky as in the above plots].

Instead for each subject/friend pair they sampled the interchart resonances for a normal distribution of friend birth dates, with mean = actual birth date and sd = 2 years (Simulation 1, sd = standard deviation), or sd roughly proportional to the age difference between subject and friend (Simulation 2). The resonance scores were then averaged to give a random score for each subject/friend pair that avoided any speculation about demographic and other effects.

Results

Unfortunately the authors present the results of their t-tests only as z scores, which for non-technical readers is not helpful. However the samples sizes are reported or can be estimated, which has allowed the z scores to be converted to approximate correlations via $r = z/\sqrt{N}$.

For example the z score for the first entry in the table below is 2.82 for a total of 466 subject/friend comparisons, which gives an approximate $r = z/\sqrt{466} = 2.82/21.6 = 0.131$. The p value for $z=2.82$ is 0.0048 two-tailed, but to keep things simple the authors did not correct for the many dozens of tests made.

Here are the values of $z/\sqrt{N}$ for the two friendship levels. Does sample 2 replicate sample 1?

Test	Sample 1 N=137		Sample 2 N=227		
	Normal N=466	Intense N=613	Normal N=648*	Intense N=851*	
1	.13	-.01	-.05	.05	To keep columns aligned, decimal points have been omitted from negative values
2	.13	-.02	-.06	.02	
3	.10	-.02	.01	.03	
4	.10	-.05	.00	.06	
5	.12	.02	-.04	.09	
Mean	.11	-.02	-.03	.05	
r N=5	---	.46 ---	---	-.11 ---	

*Not reported, so estimated from sample 1. Even large errors will have little effect.

The $r = z/\sqrt{N}$ values for the two samples are not only very small (mean 0.029) but the two samples show almost perfect disagreement (look at the direction of the r values). The results for Tests 4 and 5 (focused on the most resonant planet), and for Test 3 (focused on Saturn), are not noticeably different from the others. The above results are for Simulation 1. Those for Simulation 2 are similar and show similar disagreement between the two friendship levels.

Could this negative result be blamed on differences between the questionnaire and internet samples? To find out, the authors repeated their tests after splitting each sample in half. The results indicated that chance was responsible, not sample differences. The authors conclude:

With these results our null hypotheses are confirmed. There is no more resonance than could be expected randomly between the charts of friends and of people in a long-term relationship. This applies for normal relationships as well as for intense relationships. ... the obvious conclusion seems to be that there exists no astrological effect (pp.844-845).

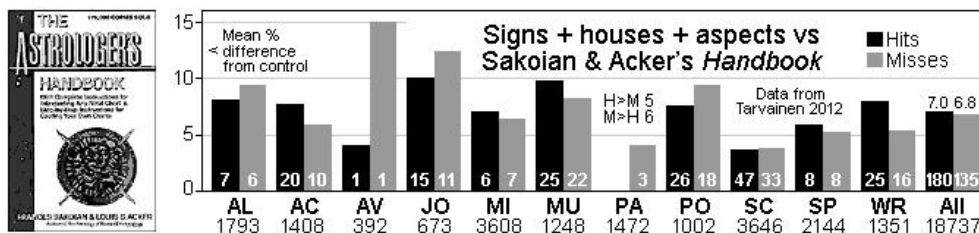
Comment The sample sizes are too small to reliably determine such tiny r levels, see 8.2.5. The authors indicate that without their replication they would have been led to chase after new speculations. The moral should be obvious. After all, no result is accepted in science unless it has been amply replicated by independent observers, see 7.7.2016.3 (shoot enough arrows). But as shown by the tests in this book, replications in astrology are rare. So the crucial question that every reader should automatically ask of any result is: Does it replicate? Automatic crucial answer: If there is no replication, don't take it seriously.

7.6.2012.3 Testing statements in *The Astrologer's Handbook*

Kyösti Tarvainen, *Correlation* 28(1), 5-24, 2012. Sakoian and Acker's best-selling cookbook *The Astrologer's Handbook* 1973/1989/1993 (175,000 copies sold by 1993) gives interpretations for planets in signs and houses, but especially for aspects. The interpretations are strictly traditional "prepared by two modern astrologers with faith in the ancient laws" but are still to be tested ... [to discriminate] between imaginary and real messages from 'on high' ... being "more in the nature of announcement than pronouncement" (from the original 1973 Preface by Minor White).

The author analysed the charts of Gauquelin professionals (11 groups mean N = 1703, total = 18737) to see if their occupations matched relevant statements in the *Handbook*. For example if a statement said *many writers have X*, was factor X strong in the charts of writers? The statements were for the sign and house positions of SO, MO, ME, VE, MA, JU, SA, UR, NE, PL, NN, AS, MC, together with aspects for which the average orb was 7°. To qualify as a hit, the match had to be better than the match with control charts prepared by shuffling birth place, year, month, and local birth times, together with dates generated at random within ± 30 days of the original birth dates. Of 316 relevant statements, 180 (57%) were better matched by a test group than by controls, which the author claimed supported the *Handbook's* "overall validity".

Comment Although total hits were more than total misses (180 vs 136), the results are less encouraging when organised by professional group as plotted below from the author's results:



The Gauquelin groups run from alcoholics at left to writers at right. When compared with controls, only 5 of the 11 groups show more hits than misses vs *Handbook* statements, close to the $11/2 = 5.5$ expected by chance. The number of relevant statements is shown on each bar. The minimum was 3 for painters (where predicting VE in LE = ability in painting turned out to be false because VE in LE was 8% less than in the controls). The maximum was 80 for scientists (where predicting SO in CP = scientist turned out to be true because SO in CP was 7% more than in the controls). The average difference from controls was +7.0% for hits and -6.8% for misses. In the above plot, the sample size N is shown below each group ID, for example N = 1793 for alcoholics, 1408 for actors.

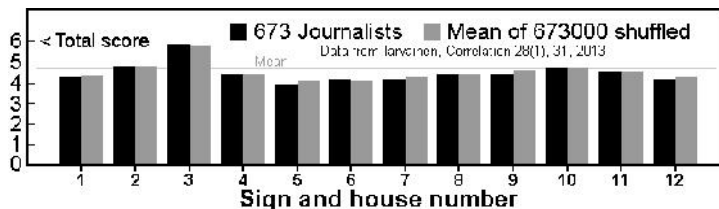
The above average difference of $\pm 7\%$ refers to $\pm 7\%$ of the number of *factors*, not the number of *charts*. The number of factors happens to be about $N/12$ for each of the three factors (planet in a given sign, planet in a given house, planet in a given aspect of orb 7°, errors here are of little consequence). So if N is 1200, about 100 cases ($1200/12$) will have 7% more (or fewer) factors than 100, and the average observation is the same plus 7%, or 107. Therefore

effect size $r = \sqrt{(\chi^2/N)} = 0.021$, equivalent to $50 + 50 \times 0.021 = 51.05\%$ hits when cchance = 50%

In other words the astrology in S&A's *Handbook* would on average perform better than tossing a coin only once in every $2/0.021 = 95$ cases, see 8.2.4.

Comment Unfortunately Tarvainen did not calculate effect sizes. Nor did he divide his samples to see if the results replicated. He also relied entirely on *p* values, which as shown in 7.7.2016.3 are not a measure of utility, nor are they free of problems due to the crud factor.

In a follow-up study (*Correlation* 28(1), 25-43, 2012) Tarvainen claims that multiple factors give more significant results than do single factors (he uses Ann Henning's speculative multiples in her *Modern Astrology* 1985, which are typical). For example if the single factor is an angular Mars, the multiple factor would include factors symbolically related to Mars such as planets in Aries, planets in 1st house, aspects to Mars, and a preponderance of Fire. His results for 673 Gauquelin journalists were the most significant of the twelve Gauquelin groups tested and are re-plotted below (from his Figure 1) as an example. Gray bars are scores for the multiple-factor (mean of sign-related and house-related scores). Black bars are the controls:



The scores are remarkably uniform except for #3, where the 0.2 excess (the largest of the differences from controls) is seen as evidence for astrology in the Gauquelin data and for the superiority of multiple factors. But for 5 excesses (2, 3, 6, 10, 11)

there are 5 deficits (5, 7, 8, 9, 12) and 2 neutral (1, 4), a result no different from chance. Tarvainen says the 0.2 excess is significant ($p = 0.03$), but among twelve results the true significance is more like $12 \times 0.03 = 0.36$ or not even marginally significant. But does it replicate? He does not say, but advises that small differences often fail to replicate (p.34). If multiple factors really are more significant than single factors), the above results fail to confirm it.

This conclusion is confirmed by the corresponding most-significant p values and sign/house number for the twelve Gauquelin groups tested, which were as follows (pp.34-37):

p	s/h	N		p	s/h	N	
0.39	12	1793	alcoholics	0.30	12	622	murderers
0.47	1	3608	army leaders	0.09	6	2552	physicians
0.26	5	4127	artists	0.41	10	1002	politicians
0.029	3	673	journalists	0.37	11	1094	scientists
0.28	1	616	liberation fighters	0.88	1	2536	sports champions
0.16	12	3256	mental patients	0.31	3	1352	writers

Only one group (journalists) are significant $p < 0.05$ compared with $12 \times 0.05 = 0.6$ expected. Again there is no hint of anything useful. (Mean $p = 0.329$, mean $N = 1936$, for which the corresponding effect size $r = 0.022$, definitely not even remotely useful.) Nevertheless Tarvainen concludes that his results indicate "in this data, overall validity of ordinary astrology" (p.38). **Comment** Would you agree? If yes, why and with what confidence?

7.6.2012.4 Do serial killers show astrological effects?

Jan Ruis, *Correlation* 25(2), 7-44, 2007 and *Correlation* 28(2), 8-27, 2012. A study prompted by Joanne Wickenburg's uncontrolled 1994 study *Sociopathic Personalities/Serial Murders* $N=44$ that found a vague emphasis on MO SA SG CP, and Bob Marks's controlled 2004 study *Frequencies of Various Aspects in the Horoscopes of Murderers and Serial Killers* $N=60+100$ respectively that found 6 signs (mostly GE CP SC), 9 houses (mostly 1,6,7,12), and 22 aspects (mostly unusual midpoints like UR = Ceres/Chiron) worthy of further study. With thanks to Dr Ruis for helpful comments.

Ruis begins by pointing out that if some reported astrological effects were genuine:

higher effect sizes are to be expected in samples that are more homogenous with respect to certain behavioural or psychological factors. Serial killers can be considered quite homogenous with respect to common psychological traits, which manifest at an early age, and with respect to background, which is mostly dysfunctional ... If astrology works, then one would say that serial killers should display common factors in their birth charts (p.7). [In other words, as per Verhulst in 8.4.7, we can boost astrological signals by reducing noise due to over-diversity of traits and lifestyles]

He then points out that this homogeneity is offset by five different types of serial killer:

1. *Visionary* (visions or hallucinations demand killing).
2. *Missionary* (does society a favour by killing people).
3. *Hedonistic* (motivated either by lust or excitement).
4. *Control freak* (needs to dominate a helpless victim).
5. *Sadism* (sometimes accompanied by financial greed).

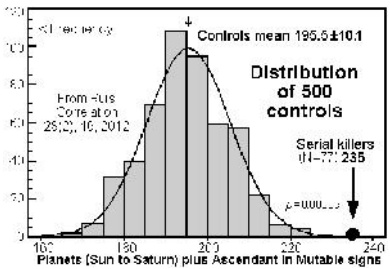
Also, serial killers are not like multiple murderers and rampage killers (who typically show no sadism, no overkill, and do not revert to normal life between each kill as serial killers do), so he used a check list to make sure only genuine serial killers were selected for study.

In two articles totalling 58 *Correlation* pages and nearly 60 tables and figures, Ruis tests the astrological hypotheses about serial killers put forward by astrologers Liz Greene and Howard Sasportas in their 1987 astrology book *The Development of Personality*, and which relate to these known features of serial killers (here abridged):

1. Dysfunctional childhood (emphasis on Mutable signs especially Moon),
2. Lack of empathy (emphasis on Moon aspects from outer planets but not Jupiter),
3. Strong fantasy life and parasitic lifestyle (emphasis on Pisces, 12th house, stress aspects to Neptune),
4. Sadism and sense of power (emphasis on Mars-Saturn and Mars-Neptune stress aspects),
5. Psychopathic killers (emphasis on Moon-Chiron and Mars-Chiron aspects),

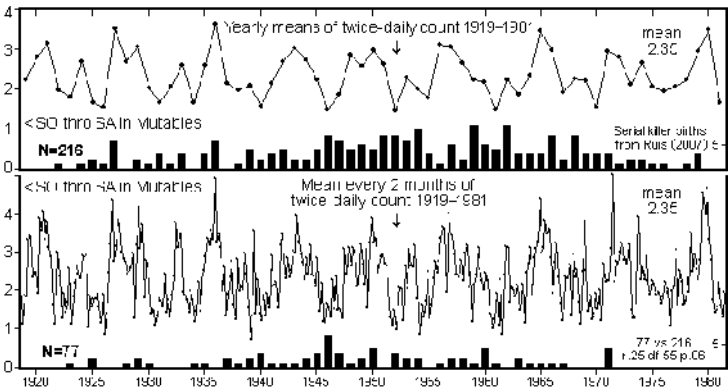
a total of respectively $1+5+3+2+2 = 13$ hypotheses. Birth data were scarce but from AstroDataBank and three internet sources he was able to collect 77 timed and 216 untimed births of white male serial killers. Control samples were generated by repeated sampling from 6000 ordinary people on AstroDataBank files matched to the years and places of serial killer births, and by repeated sampling from 10,000 cases prepared by shuffling the serial killer birth data.

The various chart factors were counted in each serial killer sample and compared with the same counts in the control samples. The most significant and replicable result involved planets in Mutable signs, followed by stress aspects to Neptune. Moon aspects to the Ascendant were significantly high (those to the MC were higher but were not predicted); those to planets were nonsignificantly low but Saturn was significantly high. Planets in 12th house were mostly



significantly high but their replication could not be checked with the untimed births. Emphasis on Pisces was marginal. Emphasis on Moon-Chiron and Mars-Chiron aspects was at chance level. For the above 13 hypotheses the outcome was 3 hits, 2 uncertain, and 0+3+1+2+2 = 8 misses.

The frequency of SO through SA plus Asc in Mutable signs totalled 235. Mean for 500 controls each of N=77 randomly sampled from N=10,000 was 195.5, sd 10.1. So the significance of 235 was $z = (235-195.5)/10.1 = 3.911$, two-tailed $p = 0.00009$, the most significant of Ruis's result.



Distribution of births (black bars): 88% of N=216 (top) and 91% of N=77 (bottom) were born after 1920 with a broad peak around 1940-1970. The earliest serial killer was born in 1849.

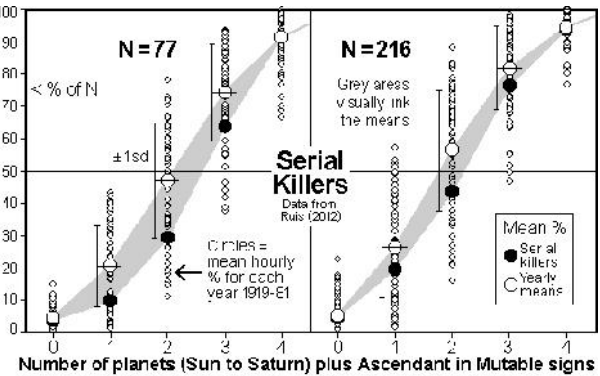
Top: Yearly mean counts SO thro SA in Mutables show clear peaks due to Saturn. But the correlation between those yearly counts and yearly serial killer births is close to chance:

top N=216 $r +0.05$ $df 51$ $p 0.75$
bot N=77 $r -0.22$ $df 34$ $p 0.19$.

Bottom: The mean every two months reveals spikes due to Jupiter.

After considering the various hits and largely ignoring misses, Ruis concluded that:

serial killers show effects that appear to confirm astrological principles and are unlikely due to artifacts (p.8).



Comment Adjacent plot shows no clear link between Mutables and killer births. Mutables can occur more frequently than killers, a potential artifact see 7.4.1985.3.

◀ Mean yearly number of factors (as % of N and measured every hour to minimise errors in counts) confirms the wide variation within each year. Means are consistently less than serial killer means but usually by <1 std deviation, which suggests that effect sizes should be small.

The lack of independent support for sign validity is a worry. Indeed, although $p = 0.000,09$ may seem very convincing, the associated r effect sizes for N=77, and for N=216 using expectancy=195.5 $\times$ 216/77=548.4, are neither convincing nor large enough to escape concerns about artifacts, see 7.7.2016.3:

For N=77 mean obs = 235/8, mean exp = 195.5/8, $r = \sqrt{(\chi^2/N)} = 0.138$ [8 = SO through SA plus Asc]
For N=216 mean obs = 571/7, mean exp = 548.4/7, $r = \sqrt{(\chi^2/N)} = 0.017$ [7 = same, no Asc for untimed births]

Especially when observed planetary totals in Mutable do not correlate in the right direction:

Factor	SO	MO	ME	VE	MA	JU	SA	Correlation
Obs (N=77)	30	34	32	28	28	23	27	) $r -0.532$ ie wrong direction) $p 0.22$ but not significant
Obs (N=216)	77	79	78	71	93	99	74	

So the 2012 *Correlation* editor's conclusion that Ruis's results suggest only "avenues for further

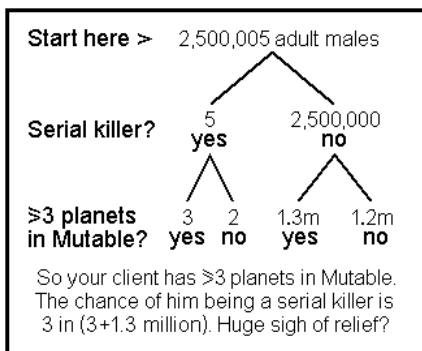
inquiry" (p.6) might be preferred. Especially as Greene and Sasportas's factors disagree with those for homicidal tendency in Charles Carter's *Encyclopædia of Psychological Astrology* and in Cornell's *Encyclopedia of Medical Astrology* (which also largely disagrees with Carter), so why bother with symbolism that astrologers do not agree on? Or indeed with any topic for which subjects are too few to allow independent replication? There are further problems:

Serial killings are almost always committed by white males (Holmes and De Burger, *Serial Murder* 1988) and tend to be an all-American phenomenon (Cameron and Frazer, *The Lust to Kill* 1987). So a link with serial killers seems unlikely unless astrology can also indicate gender and nationality. More importantly, as noted in 7.6.1982.5, the frequency of a given attribute (here serial killing) in the general population has to match the frequency of chart factors that could be relevant. The figures cited by Ruis suggest that every year something like 3 or 4 male serial killers are born in the USA (which is compatible with the estimated 100 serial killers that exist in the USA at any given time, see Hare, *Without Conscience: The disturbing world of the psychopath* 1999) or about 1 in 500,000 of the two million males born each year in the USA. But factors that apply to 1 in 500,000 births and not to the other 499,999 are unlikely because they would have to exist for only 1/500,000 of the time, or roughly one minute each year, so serial killers might tend to share similar birth dates (and they don't). If births were spread over various moments, the factors would be so fleeting that the imprecision of most

birth times would deny their testability. If they did not occur each year it would deny factors like MA-90-NE.

In any case astrologers presumably want to identify serial killers, not tell serial killers their charts tend to be higher in X than average. Even though Ruis stresses how Greene and Sasportas do not claim that the former is possible, it is what Joanne Wickenburg in her 1994 study hopes to do with a view to helping police.

Even when the results for say 3 or more planets in Mutable signs are translated into practice (3 was more effective than 2 or 4), problems still arise due to the extremely low chance of an accurate prediction.

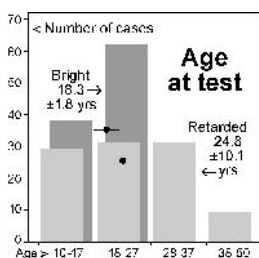


7.6.2013.1 An Indian test of Indian astrology with 200 subjects

JV Narlikar, *Skeptical Inquirer* 37(2), 45-49, 2013. An expanded version of JV Narlikar, S Kunte, N Dabholkar, and P Ghatpande, A statistical test of astrology, *Current Science* (India) 96(5), 641-643, 2009. Emeritus Professor Narlikar is at the Inter-University Centre for Astronomy and Astrophysics, Pune. Described by India's OPEN magazine as "India's most famous astrophysicist", he is internationally known for his work in cosmology, and has long had an interest in astrology. The test is probably India's first controlled test of astrology, so it is summarised below in some detail.

Our test was performed in the university city of Pune (formerly Poona) about 120 km south-east of Mumbai (formerly Bombay) in the state of Maharashtra, which is the second-largest in area (308,000 sq km, 10% of India) and third-largest in population (100 million, 9% of India) of India's 25 states. Pune itself has a population of about two million.

Indian astrologers claim to tell intelligence from a person's birth chart. So volunteers from the Committee for the Eradication of Superstitions went to normal schools and collected the

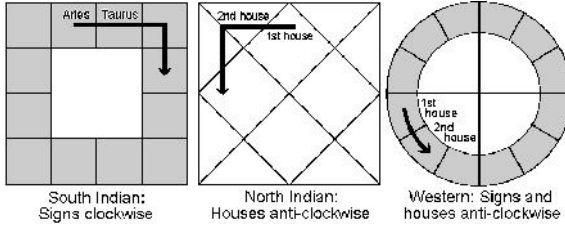


names of teenage school children rated by their teachers as mentally bright. They also collected names from special schools for the mentally retarded. The potential destinies of such cases could hardly be more different, so they were ideal for testing Indian astrologers. From the collected data we selected 100 bright and 100 handicapped cases.

Breakdown by age of our 100 bright and 100 handicapped cases. About half of the 100 handicapped cases are older than the 100 bright teenagers. This could have provided a small cue to their respective identities but evidently it did not.

Birth details were obtained from their parents because birth certificates are rare in India. (Professional Indian astrologers routinely assume that birth details provided by parents are correct,

so our procedure followed the norm.) Each birth chart was calculated by Prakash Ghatpande, a former professional astrologer, using commercial astrological software. All charts were coded and stored in safe custody by Professor Kunte at Pune University, so neither I nor the astrologers could know their identity.



Indian birth charts are a different shape from Western birth charts, and their signs, houses, and aspects are calculated differently. They also differ in how they are interpreted. A Western-style interpretation focussing on the owner's personality and motivations would be rejected in India, where clients require fortune-telling.

Publicity. We announced our test at a press conference in Pune on 12 May 2008 and invited practising astrologers to take part. We explained that each participant would be given 40 birth charts drawn at random from our set of 200, and would have to judge whether their owners were mentally bright or handicapped. We also invited established astrological organisations to take part, for which they would be given all 200 birth charts (a sample size appreciably larger than in any Western test of astrologers).

The press conference was reported in almost all local and regional newspapers, and proved to be an efficient way to reach astrologers. Within a few days we received about 150 telephone calls from astrologers all over Maharashtra expressing their interest. We asked them to send us their names, experience, and method used, and a stamped self-addressed envelope for their 40 birth charts. They were allowed one month for making their judgments. In due course 51 astrologers asked for birth charts, of which 27 sent back their judgments. The rest did not tell us why they did not participate.

Objections. In the meantime a deputation of astrologers from the Pune and Maharashtra astrological societies expressed concern that, because the data had been collected by skeptics, the test would be biased. We assured them that the skeptics had no active role in running the test, and that the test was double blind to make sure it was entirely fair. But for some reason they were not convinced, and tried (unsuccessfully as it turned out) to persuade astrologers not to participate. A month later, at a Pune astrological seminar, we explained that tests, indeed many tests, are necessary if astrology is to establish itself as a science. The organiser said he could provide a set of ten rules that would tell whether a birth chart's owner was mentally bright or retarded, and urged the astrologers present to participate in our test.

In India every leading astrologer has his own astrological organisation, so we wrote to those on our list (about a dozen) inviting them to judge all 200 birth charts. Two responded with expressions of interest, of which one sent in judgments. The other remained silent.

Although the Maharashtra astrological society had urged astrologers to boycott our test, its president kept meeting with us. Among other things he gave us a rule for predicting sex, and another rule for predicting intelligence, both of which he claimed were correct in 60 per cent of cases. But when applied to our set of 200 birth charts, the predictions were respectively 47 and 50 per cent correct, so his rules offered no advantage over guessing.

Comment One Hindu rule says sex is shown by the navamsa-dwadasamsa (108th part) of the sidereal Ascendant (BV Raman personal communication 1976), which takes about one minute to rise. Odd-numbered parts = male, even-numbered parts = female. Because the position of the sidereal zodiac is disputed, the method is impossible to check, even if the birth was timed accurately enough and there was agreement on when it occurred. **End of comment.**

Results. Of the 27 astrologers who participated, not all provided personal details, but 15 were hobbyists, 8 were professionals, 9 had up to 10 years of experience, and 17 had more than 10 years of experience. Their average experience was 14 years. So in terms of experience they were clearly a competent group.

If the astrologers could tell intelligence from a person's birth chart, they would score close to

40 hits out of 40. In fact the highest scores were 24 hits (one astrologer) and 22 hits (two astrologers). The remaining 24 astrologers all scored 20 hits or less, including one professional astrologer who found 37 intelligent and 3 undecided (so none were retarded!), of which 17 were correct. The average for all 27 astrologers was 17.25 hits, less than the 20 expected by chance and well within the difference of ± 3.16 needed to be significant at $p = 0.05$.

The institution whose team of astrologers had judged all 200 birth charts got 102 hits, of which 51 were bright and 51 were retarded, vs 50 and 50 expected by chance. So despite the collective benefit of teamwork, their judgments were clearly no better than tossing a coin.

Most unfortunately our statistician Sudhakar Kunte died in an accident in 2011, and the security he imposed on data storage has so far prevented us from performing further tests, such as whether the astrologers agreed on their judgments, whether they could pick high IQ better than they could pick retarded, and whether the three methods used (Nirayan, Sayan, Krishnamurty) differed in success rate. **Conclusion.** Our test of 27 Indian astrologers judging 40 birth charts each, and a team of astrologers judging 200 birth charts, found that none were able to tell bright children from retarded children better than chance. Our results are firmly against Indian astrology being considered as a science.

Narlikar comment. Over the years I have made many public statements against the pseudoscience of astrology, which earned me a chapter titled "The Narlikar Episode" in a 348-page 1998 book *Astrology and the Hoax of "Scientific Temper"* by the astrologer Gayatri Devi Vasudev, then editor of *The Astrological Magazine*. Her book tries to show that scientific inquiry or "scientific temper" is prejudiced against astrology, and that critics are ignorant of both science and astrology. It accuses me of entering areas I had not investigated and was therefore ignorant of. For example I had made the supposedly inexcusable mistake of declaring that astrology was not a science. I hope the present investigation can set the record straight.

7.6.2014.1 Levels of consciousness in 27 astrologers

Armand Diaz, Testing astrologer's consciousness levels. Interview in E Snow (ed) *Astrology Considered* 2014. And his PhD thesis *Divination as a Life Path in Contemporary America: An in-depth exploration of the world of psychic-mediums*. California Institute of Integral Studies 2011. The author is a practising astrologer with "repeated exposure to the efficacy of astrology, psychic-mediums, and other divination experiences" (p.8). First his study of psychic-mediums:

The subjects were 20 full-time or part-time professional psychic-mediums, mostly in north eastern USA, whose fees were typically \$100 an hour. Here *psychic* means getting information by extra-sensory processes with or without the aid of eg Tarot cards; *medium* means contact with non-living beings such as dead people. There is no clear distinction. Thus psychics can act as mediums, mediums as psychics, and all "seem to know some astrology" (p.2).

His aim is to see how psychic-mediums describe their methods and experiences of divination, whether viewed as a process going downwards into the unconscious or upwards into the realm of gods. Previous research usually focused on accuracy whereas most clients are looking for meaning (p.31), so he adopts the levels of consciousness evolution hypothesised by Jenny Wade in her 1996 book *Changes of mind: A holonomic theory of the evolution of consciousness*.

Comment re Wade's 1996 book. Her hypothesis assumes: (1) Mind is separate from brain and capable of a separate existence. (2) Reincarnation is a fact. (3) There is a transcendent reality. (4) Consciousness begins before birth and continues after death. She summarises her work as "dependent upon an immature paradigm [ie speculation] which could be proven wrong tomorrow" (p.274). She never discusses opposing views, which may explain why her book is not mentioned in the *Blackwell Companion to Consciousness* 2007 or *The Cambridge Companion to Consciousness* 2007, both thick books packed with experimental evidence and references. Her index mentions neither astrology nor Tarot.

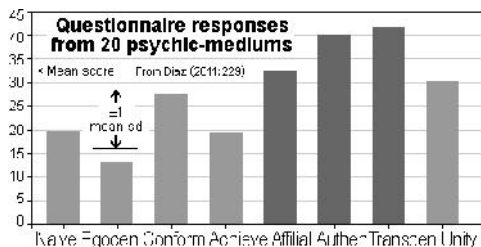
She distinguishes between transcendental (non-material) sources and brain-based sources of consciousness. Her nine speculative levels reflect the following progressive "unfoldment of being" (p.263):

1. Reactive (emphasis is on instinctive survival).
2. Naïve (same but magical and relying on others).
3. Egocentric (individual now seen as separate from environment).
4. Conformist (acceptance of own social conditions despite awareness of others).
5. Achievement (seeks to break free by individually controlling things).

6. Affiliative (seeks to break free by joining like-minded others).
7. Authentic (seeks to develop their special talents).
8. Transcendent (psychic abilities manifest).
9. Unity (merging with God). **End of comment.**

Diaz tests his 20 psychic-mediums with a 40-item questionnaire in which each of the eight levels (he excludes Reactive) has five items on a 10-point scale from strongly agree to strongly disagree. He also gave six of his psychic-mediums an in-depth interview. Example items from his questionnaire (he does not say which item applies to which level) are:

10. The most important thing to me is safety and security.
20. The right choice to make varies depending on circumstances.
30. I rarely feel guilty when I break rules.
40. Ultimately, all options are equally good and correct in any situation.



The author gives the mean scores and standard deviations for each level for 20 psychic-mediums, and individual scores for six psychic-mediums, but statistically goes no further.

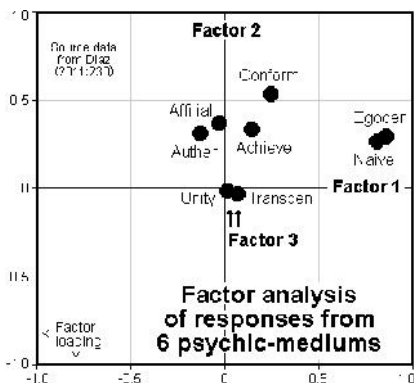
The psychic-mediums generally scored highest on: *Affiliative* (seeks to break free by joining like-minded others), *Authentic* (seeks to develop their special talents), and *Transcendent* (psychic abilities manifest).

All six of the author's interviewees recognised the spiritual value of religion but felt it was disadvantaged by rigid beliefs. All referred to their spirit guides (and to Lemuria, Atlantis, and other unproven beliefs) as casually as most people would refer to the person next door. They described their spirit guides as mostly angels, ascended masters, or discarnate spirits of dead humans. They felt that spirits were able to have some physical effect. All believed in reincarnation, and in an afterlife as a temporary state, not a permanent one. Diaz comments:

It is clear that spirit guides are an integral part of the world of psychic-mediums. The general sense I got from the psychic-mediums was that the process of giving a reading is a cooperative venture between the professional in the material world and guides in the spirit world. Most participants have more than one guide (p.114). [Nevertheless] The belief that the psychic has privy to definite and perhaps immutable information from a higher source beyond human control is not supported by anything any of the participants said during the interviews (p.127).

In summary, he found diversity among his participants but with important similarities. All of them viewed their work as a helping profession. All were highly independent in thinking and lifestyle. All were cautiously optimistic that their kind of work would eventually gain official recognition. All saw no need to convince critics of their abilities.

Comment This was a qualitative survey, so there were no controls to establish base rates, and no factor analysis to establish that the responses actually conformed to the levels hypothesised by Wade. So the plotted raw scores and their interpretations (based on Wade's speculations as given in her book) are difficult to interpret. However, when the individual scores for the six psychic-mediums (two male, four female, typical age 50s, four used Tarot cards, and one used astrology and Tarot) were independently converted to a correlation matrix and factor analysed, they gave this factor structure:



A sample of only six is far too small to give results that can be reliably applied in general. But the responses for this particular sample do not reduce to Wade's eight distinct levels. Instead they reduce to a much simpler structure, namely three levels with a less esoteric interpretation than "unfoldment of being", which with % of variance explained are:

Factor 1 = first two levels together ("aware of environment") 67%.

Factor 2 = next four levels together ("does own thing") 22%.

Factor 3 = last two levels together ("believe in hidden realities") 11%.

Contrary to the speculations based on the previous plot, the responses identify more with hypothetically lower levels than with hypothetically higher levels. The higher levels are still represented but they no longer come first. And of course without controls and large-sample tests it is hard to know if they mean what they are supposed to mean.

Unfortunately Diaz never mentions hidden persuaders such as Barnum effects or cold reading, or informed researchers such as Susan Blackmore and Ray Hyman. He does note that divination remains popular, especially among indigenous peoples. Also, because:

The people I encounter who work as astrologers and psychics, myself included, do not strike me as less cognitively sophisticated or generally less aware than other people (p.4),

he apparently never sees any need to consider alternative explanations. So his readers get a very incomplete and one-sided view of what might be happening. **End of comment.**

Diaz subsequently had his questionnaire completed by 27 astrologers from three continents. This time only seven levels were addressed (levels 2–8). Diaz quotes no data, but says:

As a group, astrologers participating in the survey strongly identified with the three highest levels of consciousness explored. Among other areas of agreement they strongly identified with the idea that "while people may hold different views and ideas, at a deep level all are fundamentally equal".

His results for 27 astrologers were evidently similar to his results for 20 psychic-mediums.

Comment 2 But as before, the results leave us none the wiser without controls to establish base rates, and without factor analysis to establish that the questionnaire actually measures what it is supposed to measure. Indeed, we cannot tell if "strongly identifying with the three highest levels of consciousness" is any different from "strongly being led astray by artifacts". If nothing else, Diaz's study illustrates the weaknesses of a purely qualitative approach, including the inability it confers on readers to know if its conclusions might be genuinely wrong.

7.6.2015.1 A salutary tale of unaspected Mars and Neptune

Various authors. Here the starting point is UK astrologer Alexander Markin's review of the 1975 AA conference, where one topic was "Unaspected Planets. A brief summary can hardly do justice to this most excellent lecture ... Dr Geoffrey Dean and a team of researchers in Western Australia are to be congratulated on their work on unaspected planets ... it is an object lesson in how to conduct and present research" (*Astrological Journal* 18(1), 2-9, 1976:9).

The above work was later summarised in *Recent Advances* (1977:362-363) as follows:

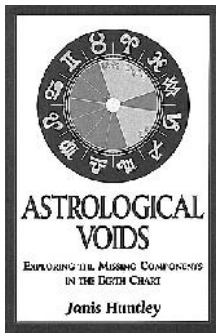
Published interpretations of individual unaspected planets tend to be spare and fragmented. Dean (*Kosmobiologisches Jahrbuch* 1977:111-113) has tested the few that exist by questionnaire survey (followed in most cases by in-depth interview) of about 70 people who were chosen for accurate birth times and lack of conflicting indications elsewhere in their charts, using as controls those with the planet aspected. The result for each unaspected planet was then carefully checked by six independent workers against a total of 60 more people plus 30 published charts and character assessments, giving a total of 20-40 cases for each unaspected planet.

EA Moore (personal communication 1976, and printed material used in Moore School of Astrology workshops on unaspected planets, New Jersey 1974) studied several dozen examples of each unaspected planet in the charts of clients and students. Wherever possible the subjects were carefully questioned to clarify the possible effects of the unaspected planet, and the results were controlled against a matching study of the planet when aspected. Each study was conducted independently without knowledge of the other.

Slightly different orbs were used (Dean 5°, Moore 7°) [but] in general their findings are in good agreement. Both workers found that the planetary principle is unchanged by lack of major aspects; but its flavour is often distinctly different from that when aspected and this leads to traits which are not indicated by any other chart factor. Inevitably many important traits remain to be discovered.

Two planets stood out. (1) Mars. Both Dean et al and Moore found unaspected Mars to be "always busy", which agreement was remarkable because it was not a traditional Mars trait. Dean et al also found that its "Effects were the most outwardly marked and distinctive of all unaspected planets" (p.364). (2) Neptune. Dean et al found it to be the only planet where lack of aspects made no obvious difference (a provocatively Neptunian finding), but many famous psychics had Neptune unaspected. Moore found "intuitive, very strong psychic ability".

In 1978 US astrologer Janis Huntley began to study unaspected planets. Although unaware of the above work her 1991 book concluded that unaspected planets were significant and could often dominate a chart. Her



findings for Mars (reckless quality that needs to be harnessed p.113) and Neptune (inspirational gifts such as art or psychic ability p.118) were not unlike (1) and (2) above. But was this merely the result of symbolism creating plausible similarities? To find out, in 2015 Dean analysed a set of 185 timed birth charts of subjects (mostly from astrology conferences in the UK, Australia, and New Zealand) who had completed the EPI and a 40-item case history questionnaire that included two items addressed to (1) and (2) above. Average age was 35 years, range 19-63. About 80% were female. A planet was unaspected if it had no major aspect or only one, orb 5°. The two items (here abridged) and endorsed frequencies were:

Mars. *Always busy, generates endless work for self.* True for 16 of 53 unaspected cases or 30%, not especially 20%. not definitely one or the other 50%. Also true for 42 of 132 not unaspected cases or 32% (vs 30% for aspected cases).

Neptune. *Very intuitive, perhaps psychic.* True for 26 of 49 unaspected cases or 53%, not intuitive 10%, not definitely one or the other 37%. Also true for 73 of 136 not unaspected cases or 54% (vs 53% for aspected cases).

Compared with males, females were slightly busier (30% vs 20%) and more intuitive (60% vs 50%).

Despite the apparently careful working conditions, the observed meanings were not supported as differentiating Mars or Neptune without aspects from the same planet with aspects.

Comment The results seem too clear cut to offer hope that a more elaborate questionnaire, a larger sample, and a more rigid definition of *unaspected*, might change the outcome. They show how easy it is for flexible symbolism to create plausible differences that later tests are unable to confirm. Of course in harmonic terms a planet is always in aspect with everything, which turns the lack-of-aspects idea into just another disagreement for adding to the list.

7.6.2015.2 What leads to belief in astrology? N=1460+826

Tim Sandmann. *Zeitschrift für Anomalistik* 15, 281-302, 2015 followed by two commentaries 15, 303-316, 2015. Similar studies exist but this one is unusual in having a replication that manipulated variables vs chart readings.

In 2012 the author sent a questionnaire by email to every student at the Philipps-Universität Marburg via the university's central mailing list. To measure belief in astrology it contained seven questions on each of three independent factors known to be relevant:

- Agreement with astrological beliefs (*you can learn a lot about yourself from a horoscope, astrology is unscientific*).
- Knowledge of astrology (*do you know the characteristics of your zodiac sign, what other factors make up a horoscope*).
- Personal importance (*do you sometimes read your horoscope column, have you ever been advised by an astrologer*).

It also included (1) a German version of the Rational Experiential Inventory to measure faith in intuition (reliance on gut feelings) and need for cognition (reliance on thinking), (2) the screening scale of the Trier Inventory on Chronic Stress to measure stress level and anxiety, and (3) a 10-item checklist about traumatic experiences such as accidents and the death of a friend. Items (2) and (3) were included because worried and overstressed people tend to feel a loss of control, which other studies have found leads to an increased belief in astrology.

1480 students (61% female) returned the questionnaire, of which 1185 were sufficiently complete to allow analysis. Regression analysis gave these correlations with belief in astrology:

Factor	Correlation r	
Faith in intuition	0.36	)
Need for cognition	0.18	)
Stress level	0.24	)
Worrying strain	0.22	)
Traumatic experiences	0.15	)
Gender	0.33	)

All are highly significant $p < 10^{-6}$

Compared with earlier studies, the links with worry and gender were confirmed (compared with men, women believe more strongly in astrology), and there was a new link with faith in gut feelings (stronger in women than in men) as a predictor of belief in astrology. There was no significant gender difference in the effect of traumatic experiences.

There was no experimental manipulation of variables, so the observed link with worry was not necessarily due to a perceived loss of control (correlation is not causation). So a second survey

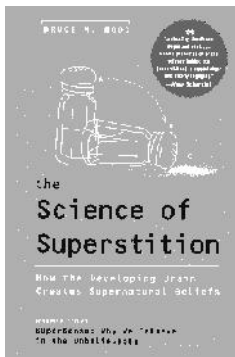
was emailed out to discover how gender and perceived control related to belief in astrology in which subjects were given a chart reading. The real intention of the survey was disguised by a cover story saying the aim was to evaluate astrology software. The survey consisted of 4 parts:

- Questions about the subject's personality and attitude to astrology.
- A chart reading supposedly based on their birth data but was either the same positive or the same negative.
- Questions to measure locus of control (internal vs external) and the meaningfulness of life.
- Questions about age, gender, social background, and how well the intention of the study was understood.

826 students (70% female) returned the second questionnaire of which 244 (positive reading) and 239 (negative reading) were sufficiently complete. Average age was 23.9 years, females were even more over-represented than before, and contrary to expectation the approval of chart readings vs gender was not significantly different although in the expected direction (ie positive readings were approved more than negative). Division into shorter vs longer reports made no difference. But most of the students had seen through the cover story, which meant that this particular approach to an email survey was a failure.

Nevertheless the reliance on gut feelings was much more pronounced for positive readings than for negative readings, which confirmed the importance of "how I feel about it" in assessing astrology (as distinct from say " $p < 0.05$ "). The author concludes that gender differences in belief in astrology can be partly explained by differences in the reliance on gut feelings and perceived control, but stresses that the restriction of his samples to students must limit the extent to which the results could be applied to other populations.

The commentators (S Ertel and U Voltmer) stress the importance of gut reactions in both art and science. Astrology is a popular belief (horoscopes in the German press are regularly read by 75% of readers). Yet the number of DAV-trained astrologers has risen from 100 in 1950 to only 900 today more than 60 years later, or about 1 in 87,000 of the adult (>18) population of the main German-speaking countries (Germany, Austria, Switzerland). Why is there such a willingness to believe, or at least indifference, and hardly any opposition?



Comment Presumably because it seems to work, and the media and astrologers make money from it (anything negative doesn't sell). Bristol University experimental psychologist Professor Bruce Hood, in his 2009 book *The Science of Superstition: How the developing brain creates supernatural beliefs*, sees supernatural beliefs as an inevitable part of human nature. Our brains didn't arrive millions of years ago ready to start work. They had to evolve to cope with a world whose nature was everywhere hidden, and they had to replace its anxiety-provoking mysteries with comforting order. Activity was fuelled by feelings. Which is why we invented gods and spirits and omens to explain things for which there was no obvious explanation, like why people got sick and winters were cold.

But as the writer GK Chesterton pointed out, when we stop believing in gods we don't believe in nothing, we believe in anything. That is the way we are. We cannot help it. Today you can:

Wander the corridors of the science department in any modern large university, and you will find experts in the most minuscule details of nature. We have reached out to the farthest galaxies and delved into the subatomic through our science. ... Yet beliefs in the supernatural – beliefs that are unnatural and unscientific – are still very common (p.42).

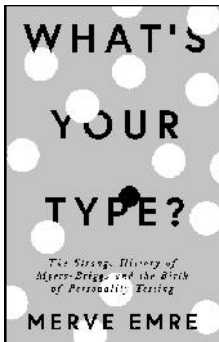
Which is unsurprising. Science can be hard, threatening and incomprehensible, while super-nature is easy and comforting (if also incomprehensible). Which is why cherished but wrong beliefs are totally resistant to reason. *No matter how much critics attack such beliefs with facts and rational arguments, they will be largely wasting their time*, at least in their own lifetime. Thus in 2005 a Gallup poll asked more than 1000 US adults (living in supposedly the most scientifically advanced country in the world) whether they believed in certain supernatural things. Here are the results in decreasing order of popularity, first column first:

ESP (41%).	Astrology (25%).
Haunted houses (37%).	Communication with the dead (21%).
Ghosts (32%).	Witches (21%).
Telepathy (31%).	Reincarnation (20%).
Clairvoyance (26%).	Spiritual possession (9%).

Taken together, 73% of US adults (and therefore probably you as well) believed in at least one, while only 27% did not believe in any. The figures have hardly changed in 15 years and seem unlikely to change in the next 15 or even 50 years.

Hood points out that our natural inclination towards supernatural beliefs explains why:

Many highly educated and intelligent individuals experience a powerful sense that there are patterns, forces, energies, and entities operating in the world that are denied by science. [But they are] almost always anecdotal, piecemeal, or so weak they barely register as being really there. Experiments on the supernatural invariably amount to nothing. Otherwise we would be rewriting the science textbooks with new laws and observations. [Nevertheless] most of us have a supersense telling us that the evidence is really there and we should simply ignore the science and keep an open mind. The problems with open minds is that everything falls out – including our reason (pp.x,xii).



Astrology vs MBTI. In her 2018 book on the history of the Myers-Briggs Type Indicator, US professor of English Merve Emre says much the same thing but in a less scientific way. Recall that the MBTI uses Jung's ideas about personality types expressed in four dichotomies:

Introvert (I) quiet reserved vs *Extravert (E) outgoing impulsive*.
Sensing (S) detailed concrete vs *Intuitive (N) patterns big picture*.
Thinking (T) logic objectivity vs *Feeling (F) feelings emotions*.
Judging (J) organised focused vs *Perceiving (P) flexible easily distracted*.

The above dimensions give $4 \times 4 = 16$ different types such as ISTJ or its opposite ENFP, each determined by the subject's response to 80–90 questions depending on the version. The earliest version of the MBTI was invented by Jung's obsessive disciple Katherine Briggs (1875-1968), who "never had much patience for scientific thought" (p.1) and her like-minded daughter Isabel Briggs (1897-1980).

The MBTI and astrology have **many similarities**. (1) The MBTI has 16 types, astrology has 12 (AR through PI). (2) Both fail because people do not exist as types but as a continuum between extremes where only shades of grey can exist. (3) Most people can identify with any type whether astrological or MBTI (in fact the MBTI is said to give a different result for half of those who take it twice), yet few complain. (4) Neither system has empirical support, and both have attracted scathing comments about their invalidity. (5) Both are runaway popular (the MBTI is said to be the USA's most popular personality test). But as Emre points out:

What remains unexplained is why, in the face of this knowledge [the MBTI's problems], so many people – two million a year, in nearly all Fortune 500 companies and US colleges and universities, in community centers and churches and couples' retreats, in the army, the navy, and the CIA – continue not only to embrace the Type Indicator but to defend its inviolability with the kind of ardor usually reserved for matters of the deepest faith (p.xvi).

Nearly 300 pages later, none of them citing ground-breaking work on personality done outside the USA such as that by Eysenck et al, nor the MBTI's failure to become equally popular in the UK, Emre's closing words suggest an answer that could also apply to astrology:

Despite all the challenges to its validity and reliability, despite all the criticisms of its origins and uses, despite its silly ironic appropriations, the MBTI continued to operate as a powerful technology of the self. ... For those who have been listening to and speaking the language of type for the past half-century, [it] promises more than the possibility of becoming "a more perfect type", to echo the words of Carl Jung. It promises a more perfect world to come – a world made by and for true believers just like them (p.269).

7.6.2017.1 E and N vs the elements N=288

Robert Currey. Can Eysenck's E and N match the four astrological elements? *Correlation* 31(1), 5-33, 2017. Essentially a review of Dean. Can astrology predict E and N? *Correlation* 5(1), 3-17, 1985 see 7.6.1985.1, which tested whether chart factor X could predict E and N where X was variously anything from signs to angularity. No factor performed consistently in a direction that replicated except sun signs vs E, a weak effect plausibly explained by self-attribution. Dean concluded that astrology could not genuinely predict E and N. Currey (testing only elements) disagrees.

In his **first test** Currey assigned an element to each of 32 traits arranged in a circle as given by HJ Eysenck and MW Eysenck (*Personality and Individual Differences: A Natural Science Approach* 1985:50) according to combinations of E and N, see diagram below. The assigned elements showed a clear preponderance by EN hemisphere for E+ (Fire), E- (Earth), and N+ (Air), but no clear preponderance for N-. To test these assignments he counted the total frequency of SO, MO, and Asc in each element for the 288 cases of extreme E and N scores collected by Dean in 7.6.1985.1. The results were positive but weaker than his assignments had suggested ($p = 0.034$ for E; $p = 0.053$ for N). Adding ME, VE, MA made little difference.

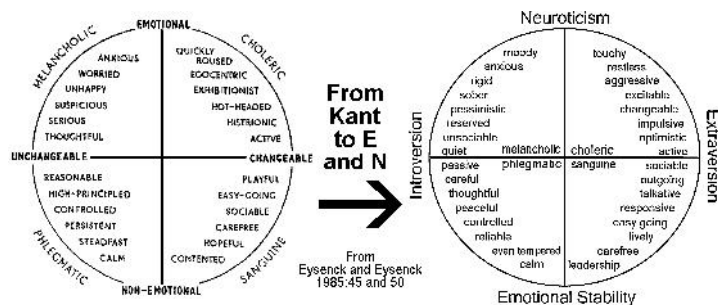
Comment Currey's results are essentially the same as Dean's, which is unsurprising since they involved the same test on the same data. Also the effect sizes (which Currey did not report) are consistent with the effect sizes observed in tests of self-attribution. He dismisses the role of self-attribution because "there is no evidence that the subjects had any interest in or connection with astrology" (p.27). But what matters here is not astrology per se but sun sign meanings, which most people (and thus probably the subjects) are familiar with, see 8.3.7.

In his **second test** Currey matched the Eysenck traits with the nearest element keywords from Hand's *Horoscope Symbols* 1981, Arroyo's *Astrology, Psychology and the Four Elements* 1975, and four others such as Mayo's *Teach Yourself Astrology* 1964. The first two showed occasional matches, the other four almost none, but Currey counts only the hits, which he then sees as confirming a correspondence between E and N and the astrological elements.

Comment This was not a test of *elements*, only a comparison of *meanings as given in selected books*. It should have looked at how astrologers actually use elements as in 7.6.1982.2. Also what it was confirming was not a genuine link between EN and the elements but the existence of a tiny effect size due to self-attribution. At which point it is worth looking at how Eysenck obtained his circle of traits because it has never been clearly explained all in one place:

Recall that the ancient Greeks identified four physical elements (Fire, Earth, Air, Water) arranged under the doctrine of opposites (Fire vs Water, Earth vs Air, but see 7.6.1979.2), further linked to four humours whose balance determined whether a person was healthy. Later Galen (c130-201 AD) linked the four humours with the four temperaments, ie the four main types of person (outgoing, reserved, rational, emotional) observed in Greek society.

The Eysencks' circular arrangement of traits allowed a comparison of the four temperaments observed by the ancient Greeks with those observed today when reduced to EN:



Left: The four temperaments as described by German philosopher Immanuel Kant (1724-1804). Kant's descriptions run to 100 words per temperament, so Eysenck had to reduce each to 6 traits in positions suggested by the tests reported in his *Structure of Human Personality* 1960.

Right: The same as originally published by HJ Eysenck and SBG Eysenck in *British Journal of Psychology* 54(1), 51-62, 1963:54. "In making up this

figure, we have drawn mainly on the results of [the present] study, but have also taken into account other published and unpublished [Eysenck] work" (p.53). The figure caption says "Diagram showing approximate positions of various traits in two-dimensional factor space". Both figures were repeated unchanged in later articles and books but with generally less detail about how the circles of traits were obtained. Perhaps because for EN purposes it was not important that only 1 in 4 of the EN traits appears in the Kant version and half of those are slightly shifted in position.

Eysenck stresses how trait *meanings* tend to depend on the person applying them, and *effects* tend to depend on the situation. In his *Fact and Fiction in Psychology* 1965:58 he explains how:

The trait-names printed in the outer ring [of the EN circle] give a rough indication of the results of modern research, in the sense that the closer the trait-names are together, the higher is the empirically observed relation between them.

In other words each location around the circle is more like a fuzzy cloud than a fixed point carved in stone. To make things worse, even if Fire traits were a perfect match to E+ traits, it does not follow that Fire in a birth chart means the person is actually E+, at least not beyond the level predicted by self-attribution. Had Currey looked at effect sizes instead of *p* values, it would have been clear that none were large enough to be of the slightest practical use.

7.6.2018.1 Jungian faces in clouds of unavailable evidence

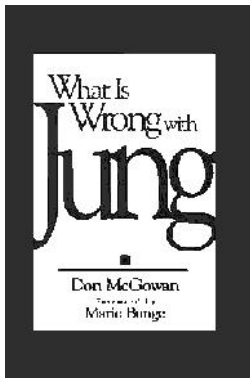
Stephanie Buck. Hiding in plain sight: Jung, astrology, and the psychology of the unconscious. *Journal of Analytical Psychology* 63(2), 207–227, 2018. A long detailed (54 references) look at Jung's lifelong interest in astrology.

CG Jung's (1875-1961) life was suffused with mysterious visions, apparitions, spiritist and clairvoyant events that he could not explain, and by secret fantasies [see 8.9.6.1 on fantasy-proneness]. By 1948 he had dismissed a scientific approach to these things in favour of archetypes, untestable mental predispositions from the collective unconscious that surface in a person's behaviour, especially during strong emotional events such as birth and marriage. Jung felt that archetypes were uniquely revealed by the symbols in a person's natal chart, hence his lifelong interest in astrology beginning around 1910. Kieron Le Grice comments:

the astrological perspective can provide a unique source of insight into the archetypal dynamics underlying our conscious experience (*Discovering Eris: The symbolism and significance of a new planetary archetype* 2012:16-17).

Buck notes that astrology was unprovable, beyond science, and unexplainable. But Jung was reluctant to reveal its powerful impact on his work in case he was ridiculed as unscientific – a ridicule that Buck avoids by attacking his critics rather than addressing their criticism.

Comment Anyone who has backpacked around the world, especially in undeveloped areas, will know that people are much the same everywhere. Indeed, all people are the same *species* so they *should* be the same, at least more so than people and cows. Thus everyone needs food, sleep, company, respect, an outlet for their talents, and fulfillment of their desire for knowledge. Everyone experiences pride, hurt, and grief at the loss of a loved one, and everyone sees life as better than death, health as better than sickness, freedom as better than tyranny, happiness as better than suffering, and education as better than ignorance. So we expect people to think, feel, and behave in similar ways, albeit subject to cultural and individual differences (not everyone is an Arabian Knight or a dedicated party goer).



Today the situation is so obvious that it is hard to see why Jung chose to complicate it by inventing untestable archetypes and a vague collective unconscious of universal human experiences like memes, except memes are not acquired at birth but are transmitted by imitation.

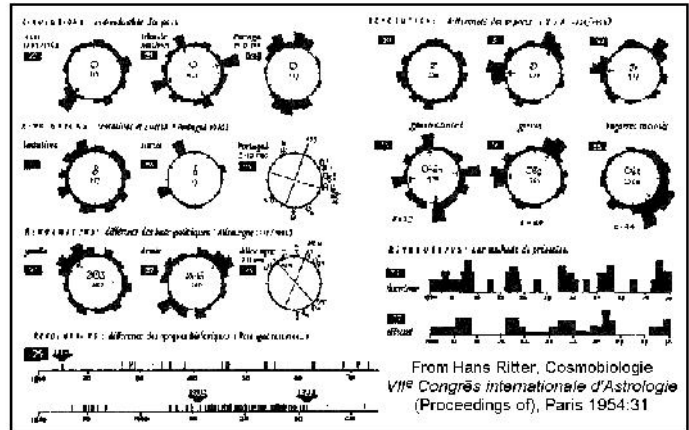
That Jung was unscientific is well-known. His sweeping generalisations were based on incomplete data and what he wanted to be true. This 1994 critique by Don McGowan finds many flaws, a consistent lack of rigour, a collective unconscious based on selected evidence, and archetypes reflecting cultural patterns not some universal property of minds. For more critiques and more details of Jung's theory see 7.7.2020.10.

Because his collective unconscious idea is comparable to the Lamarckian theory of acquired characteristics, Jung had defended Lamarckism in 1954 (Jaff ed, *Letters* 1973:2) even though it had been discredited 20 years previously. Astrology was then unexplainable, so any idea based on it was like explaining combustion by phlogiston – an idea that collapsed once oxygen was discovered. But astrology is now explainable (see 8.9.10.2), so the Jungian ideas it helped to create have similarly collapsed, simply because Jung and his disciples like Tarnas in 7.2.2006.2 and Le Grice in 7.2.2009.2 never used controls. Their failure to use controls was fatal because it allowed them to see whatever they wanted to see when comparing the fog of chart symbolism with the fog of human experiences (essentially they proved faces in clouds by looking at clouds). Controls would have shown that seeing archetypes in natal charts is no more remarkable than wrong charts working, see 8.9.9. The same problem underlies both.

7.7 RESEARCH ISSUES Includes anything not fitting previous sections.

Table 1: Sun-Moon signs in marriage (from 1970s notebook of Dr Cornelis Kuypers)

Table	$Q_1 - Q_2$	$Q_2 - Q_3$	$Q_3 - Q_4$	$Q_4 - Q_5$	$Q_5 - Q_6$
1	25	25	25	25	25
2	25	25	25	25	25
3	25	25	25	25	25
4	25	25	25	25	25
5	25	25	25	25	25
6	25	25	25	25	25
7	25	25	25	25	25
8	25	25	25	25	25
9	25	25	25	25	25
10	25	25	25	25	25
11	25	25	25	25	25
12	25	25	25	25	25
13	25	25	25	25	25
14	25	25	25	25	25
15	25	25	25	25	25
16	25	25	25	25	25
17	25	25	25	25	25
18	25	25	25	25	25
19	25	25	25	25	25
20	25	25	25	25	25
21	25	25	25	25	25
22	25	25	25	25	25
23	25	25	25	25	25
24	25	25	25	25	25
25	25	25	25	25	25
26	25	25	25	25	25
27	25	25	25	25	25
28	25	25	25	25	25
29	25	25	25	25	25
30	25	25	25	25	25
31	25	25	25	25	25
32	25	25	25	25	25
33	25	25	25	25	25
34	25	25	25	25	25
35	25	25	25	25	25
36	25	25	25	25	25
37	25	25	25	25	25
38	25	25	25	25	25
39	25	25	25	25	25
40	25	25	25	25	25
41	25	25	25	25	25
42	25	25	25	25	25
43	25	25	25	25	25
44	25	25	25	25	25
45	25	25	25	25	25
46	25	25	25	25	25
47	25	25	25	25	25
48	25	25	25	25	25
49	25	25	25	25	25
50	25	25	25	25	25
51	25	25	25	25	25
52	25	25	25	25	25
53	25	25	25	25	25
54	25	25	25	25	25
55	25	25	25	25	25
56	25	25	25	25	25
57	25	25	25	25	25
58	25	25	25	25	25
59	25	25	25	25	25
60	25	25	25	25	25
61	25	25	25	25	25
62	25	25	25	25	25
63	25	25	25	25	25
64	25	25	25	25	25
65	25	25	25	25	25
66	25	25	25	25	25
67	25	25	25	25	25
68	25	25	25	25	25
69	25	25	25	25	25
70	25	25	25	25	25
71	25	25	25	25	25
72	25	25	25	25	25
73	25	25	25	25	25
74	25	25	25	25	25
75	25	25	25	25	25
76	25	25	25	25	25
77	25	25	25	25	25
78	25	25	25	25	25
79	25	25	25	25	25
80	25	25	25	25	25
81	25	25	25	25	25
82	25	25	25	25	25
83	25	25	25	25	25
84	25	25	25	25	25
85	25	25	25	25	25
86	25	25	25	25	25
87	25	25	25	25	25
88	25	25	25	25	25
89	25	25	25	25	25
90	25	25	25	25	25
91	25	25	25	25	25
92	25	25	25	25	25
93	25	25	25	25	25
94	25	25	25	25	25
95	25	25	25	25	25
96	25	25	25	25	25
97	25	25	25	25	25
98	25	25	25	25	25
99	25	25	25	25	25
100	25	25	25	25	25



The way it was. **Left:** From the 1970s notebook of Dutch researcher Dr Cornelis Kuypers showing his manual counting of Sun-Moon signs in marriage. **Right:** Hand-drawn frequency distributions from the *Proceedings of the VII^e Congrès Internationale d'Astrologie* 1954:31. Small sample sizes have made chance variations seem important.

First, what effect has research had on consulting rooms?

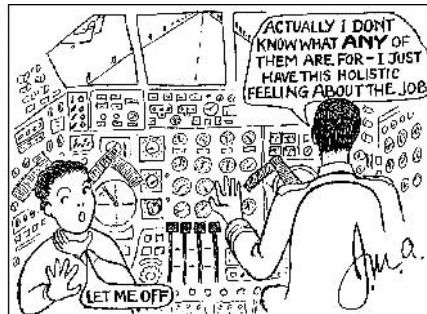
The short answer is no effect at all. Computers have eliminated the tedious time-consuming counting and analysis of data in research. But in consulting rooms they have not eliminated:

parasitic ideas whose basis cannot be demonstrated ... [but] we can almost always find something in a birth chart to provide justification, deluding us into thinking we have made a discovery (Gouchon, *Kosmos* 7(4), 32-44, 1977).

Instead computers have encouraged proliferation, as in these (abridged) excerpts from *Kosmos* 14(1), 27-48, 1984 following the assassination of Indira Gandhi on 31 October 1984:

Progressed aspects in Indira's chart included progressed Antivertex opposite progressed Pluto and the natal south node of the Moon, while progressed Pallas was quincunx the Node-Pluto conjunction. Progressed Ceres was quincunx the New Delhi natal MC, and progressed Jupiter was in a long quincunx to the north node. ... Progressed Ascendant and progressed local East Point were quincunx natal Chiron in the 8th house, while Chiron stayed conjunct the 8th house. Vesta in a long triotile to progressed Saturn in the 12th house. ... Progressed Mercury was just past the trine to natal Mars, and 21 minutes short of the quincunx to progressed Saturn. However, if we include midpoints, progressed Mercury was octile (semi-square) the midpoint of progressed Venus and Uranus. If we add new asteroids, progressed Mercury was conjunct natal Icarus. By solar arc, Mercury was in a one degree opposition to natal Saturn. ... numerous other solar arc aspects include Uranus and Ascendant square natal Moon, Pluto triotile Moon, and Mars on the I.C. The progressed Q (Quotidian or daily) angles also stood out. The Q Ascendant and East Point were conjunct progressed Mars square Q MC, and involved in the node-Pluto-Vertex combination. One of the most striking aspects was progressed Part of Death conjunct the natal Ascendant opposite natal Uranus. The formula is Ascendant plus 8th house cusp, minus Moon, using all progressed positions for the progressed Arabic Part. Progressed Uranus maintained a triotile to the natal Part of Death for many years. Progressed Mars, soon to go retrograde and moving very slowly, had remained conjunct the New Delhi Part of Death, octile the New Delhi Ascendant and triotile the natal MC, as well as trine progressed Jupiter.

The computerised listing of everything for us to pick and mix may be one way to occupy time between client arrivals, but it does nothing to advance astrology in learned circles. It reduces



what should be an inspiring and poetic process to pushing buttons while wearing rubber gloves. This essential part of astrology tends to be ignored in the pages that immediately follow but is revisited in Chapter 10.

Left. John Addey in 1976 working at home on the empirical basis of harmonics. And all by hand (this was before home computers).

Right. His view on untested significators.

7.7.1947.1 Three early library classification systems

Dr H Korsch, *Dezimal-Klassifikation für das Gebiet der Astrologie* 1932, 16pp. Vte C de Herbais de Thun, *Classification des écrits astrologiques* (in his *Encyclopédie du Mouvement Astrologique de Langue Française au XX^{me} Siècle* pp.187-196) 1944. J de Niziaud, *La méthode dans la recherche astrologique*, *Les Cahiers Astrologiques* 8, 94-98, Mar-Apr 1947. The Dewey system used around the world is well suited to the kind of astrology books stocked by public libraries but not to the full complexity of astrology. The three systems summarised here are rare early attempts to find an alternative.

The first is due to **Dr H Korsch** (1932), then the main force behind German astrology, and was modelled on the Dewey system. Its main categories with examples of topics covered are:

- | | |
|--|--|
| 0 General Environment (eg literature, legal). | 5 Basic Factors (FEAW, signs, aspects, geo/helio). |
| 1 History (early, middle, late). | 6 Natal Techniques (solar charts, houses, rectification). |
| 2 Associated Areas (philosophy, religion science). | 7 Natal Interpretation (appearance, character, abilities). |
| 3 Approaches (symbolic, empirical). | 8 Mundane (political events, weather, earthquakes). |
| 4 Astronomical Basis (astronomy, ephemerides). | 9 Prediction (directions, ingresses, horary). |

It has 450 named categories formed by adding digits, of which half have 3 digits and a quarter have 4 or more. Today it might need another 100 named categories.



The **de Herbais** (1944) system is very different from Korsch's. It is based on book surveys and is thus closely related to what astrology books are actually like. His primary division is based on general vs specific rather than on topic A vs topic B. Its main categories are:

- 0 Books on general areas eg psychological, medical, mundane, esoteric, history.
- 1 Books on single factors or techniques eg planets, aspects, houses, stars, directions.
- 2 and 3 Books on associated areas (not specified).
- 4 Periodicals eg almanacs, journals.

It has more than 70 named categories, of which more than two-thirds have 3 or more digits. De Herbais also makes these comments about library classification in 1944:

Much of the 0 area (general) is also scattered across periodicals and is therefore hard to locate. Most of 2 and 3 is by many authors in rapidly increasing numbers producing nothing original. Periodicals are tedious to classify and tend to be of awkward format. Article titles are always imprecise.

The **de Niziaud** (1947) system (he was President of the International Centre for Scientific Astrology) is again different in aiming at better communication and at classifying by observed facts rather than by speculation. Its main categories do not immediately shout astrology:

- | | |
|--|---|
| 1 Mathematics and astronomy (any physical effect). | 5 Elections (modes, problems due to target) |
| 2 Cosmobiology (geophysics, botany, zoology). | 6 Esoteric (including religious). |
| 3 Genethliology (pathology, physiology, accidents, death). | 7 Bibliography (historical, eastern, western). |
| 4 Cycles (eclipses, dictators, epidemics, fixed stars). | 8 Similar domains (graphology, palmistry, Tarot). |



All three systems, now long forgotten, are thorough and show the many ways in which astrology can be classified. But *they are too thorough to be useful* – most astrology books would have a one-digit number, most textbooks would be largely unclassifiable, and 80% of the categories would remain unused. The systems are good for classifying astrology but not astrology books.

For example libraries with few astrology books have no problems with Dewey 133.5. But in the astrology section of the Warburg Institute in London they are not labelled by a decimal system (what looks like a label on some books is in fact blank). Shelving is by classmark such as FAN 625 (almanacs) or FAH 5325 (French almanacs).

However, books with good titles need little in the way of further classification other than say *elementary*, *advanced*, *speculative* or *evidence-based*. Articles need a more thorough treatment but the result may still not be specific enough to help you find what they want. Which is why the present book can save you much effort regardless of your attitude towards astrology.



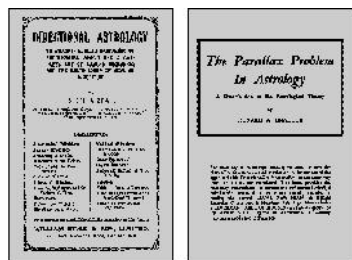
7.7.1953.1 A look at lunar parallax

Maurice Froger, *Les Cahiers Astrologiques* 43, 63-71, 1953.

A birth chart shows planets as seen from the birth place, whereas an ephemeris gives planets as seen from the Earth's centre. Unless the birth place is directly on the Earth-Moon line, the two positions will differ due to parallax. For most planets the maximum possible parallax is extremely small (0.5' for Venus, half this for Mars, half this again for Jupiter or Saturn) and is generally of no concern because most astrological ephemerides give planetary positions only to the nearest minute.

But the Moon's parallax can reach about 1° in longitude and declination. This means that in about half of all charts the Moon's longitude and declination will be in error by 0.5° , which in theory is enough to seriously invalidate small-orb techniques such as directions, and horary readings for which the Moon is commonly the most important factor.

The author says astrologers have neglected parallax because its calculation is complicated, even though Schoch's *Tables of Planetary Positions* 1938 gives a simplified method. So he presents tables for finding the lunar parallax for Paris using sidereal time and Moon's angular distance from the zenith.



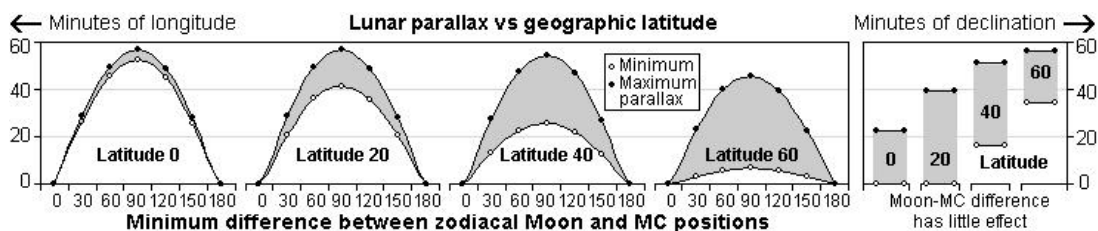
Sepharial 1921 and Bradley 1947 also give simplified methods, which are further simplified by Dean into a look-up table in *FAA Journal* 4(2), 5-9, 1974.

Comment Accurate calculation involves six independent variables including lunar distance and birth-place distance from the Earth's centre, but even with the tables provided by the various authors the calculation is still tedious, especially in the

days before hand calculators. In his 1947 booklet *The Parallax Problem In Astrology*, US researcher Donald Bradley makes this comment about accuracy and the use of logarithms:

Seven places guarantee astronomical precision in most cases. In all astrological work, only six-place logarithms are required, as this will give accuracy to seconds of arc ... Where minutes of arc only are required, as in the average birth chart, five-place logarithms will usually suffice (p.24).

For most 19th and early 20th century practitioners, such use of logarithms would be routine. Today most computer programs will give parallax-corrected Moon positions. The variation in lunar parallax with geographic latitude and MO-minus-MC position is shown in grey below.



Left: Minimum and maximum lunar parallax in **longitude** for the Moon at its average distance from Earth. Parallax is minimum when MO-MC = 0° or 180° . **Right:** By contrast, the minimum and maximum lunar parallax in **declination** for the Moon at 0° celestial latitude depends hardly at all on MO-MC. Both parallaxes increase or decrease by about 5% when the Moon is at its closest or furthest distance. Maximum celestial latitudes of $\pm 5.5^\circ$ change the parallax by up to $\pm 0.25'$ in longitude and $\pm 5'$ in declination. Corrections for parallax should be added to, or subtracted from, the Moon's ephemeris position depending on MO-MC difference and birth place, but the rules are not shown here.

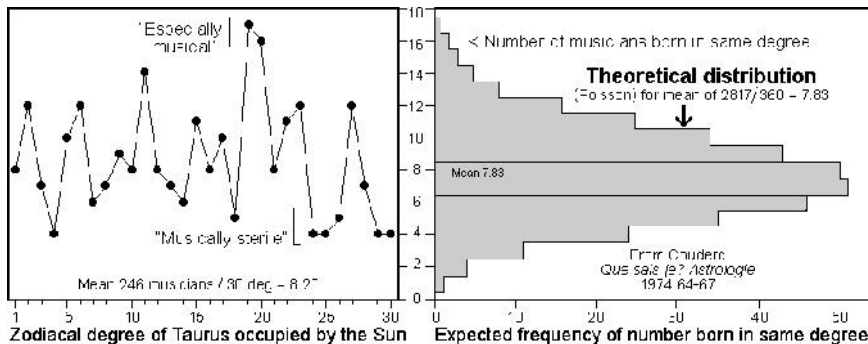
Comment 2 Most astrologers ignore lunar parallax. One says it is "not practical" (Gouchon, *Dictionnaire Astrologique* 1975:470). Another finds the Moon is effective in primary directions both with and without correction for parallax, giving "a peculiar temporal doubling in the impact" (Nosselt, *Astrologie* 1934: *Vorträge und Bericht des XIII Astrologen-Kongresses München* 1934:82-86). Another made many tests with corrections accurate to 0.1' and concluded it was advisable for directions (Schubert, *Zenit* 6, 100-104, 1935). Yet another uses a graph, but once drawn it applies only to a single birthplace (Rössner, *Tradition und Fortschritt der Klassischen Astrologie* 5, 37-42, 1957). Dutch astrologer Wim van Dam finds its use "highly complicated" but essential for New Moon charts (*Astrological Journal* 17(3), 18-22, 1970). Ironically Donald

Bradley eventually abandoned parallax-corrected Moon positions because his fellow siderealist Cyril Fagan did not favour them (Holden, *A History of Horoscopic Astrology* 1996:222). An associated issue is more subtle. Ancient astrologers worked from the visible horizon, which for them defined the Ascendant, whereas Ascendants today are defined by the rational horizon passing through the earth's centre because this is the only way a single table can be applied equally to flat and hilly areas. So you cannot look at a modern birth chart and tell whether a planet just above the Ascendant or Descendant is actually visible above nearby hills.

7.7.1974.1 Astrology vs sampling fluctuations for 2817 musicians

Paul Couderc, *Que sais-je? L'Astrologie* 1974:62-65. By the 6th edition 1978 it had sold 44,000 copies.

In the famous *Que sais-je?* series of French booklets (which has many hundreds of titles) the one on *L'Astrologie* by French astronomer Paul Couderc looks at the study of 2817 musicians by Karl Krafft in his 1939 *Traité d'astro-biologie*. Couderc had been asked by Krafft to check his claim that aptitude for music depends on the zodiacal degree occupied by the Sun at birth. Both unusually high and unusually low counts had occurred in Taurus, which led Krafft to the degree-area interpretations "Especially musical" and "Musically sterile" as shown below left:



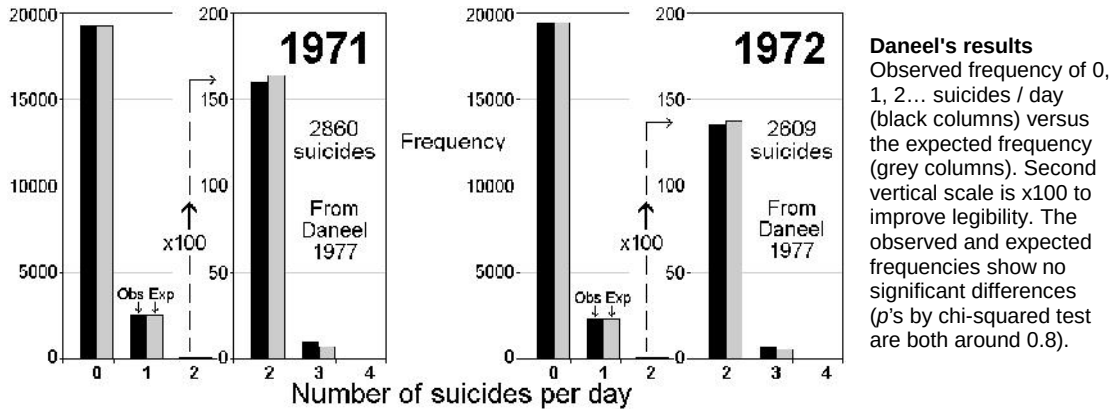
Left: Frequency of the Sun in each degree of Taurus for a total sample of 2817 musicians. Krafft interpreted the extremes as shown. **Right:** The expected distribution for 2817 random births shows that Krafft's extreme results are easily explained by chance, see below.

If events occur at random in time, they will follow a Poisson distribution, so a genuine astrological effect will show up as a departure from Poisson. But Couderc showed that Krafft's extreme results fall within the range predicted by the Poisson distribution for $N=2817$ random events over 360° . The Poisson distribution is given by $y = N e^{-M} M^x / x!$, where y = expected frequency of the number born in the same degree. N = number of degrees, here 360. M = mean count per degree, here $2817/360 = 7.83$. And x = the number (0, 1, 2, 3, ...) born in the same degree. Just as so many others have done, Krafft had mistaken sampling fluctuations for astrological effects. Krafft even claims the ancient Mayans knew of Uranus and Neptune (*Traité* p.342). Couderc comments "Should we laugh or cry?" (p.66). **Comment** At the end of his *Traité*, Krafft devotes five pages to likely criticisms of his book (pp.337-341). He starts off well enough ("Sincere and constructive criticism is welcome and necessary if experimental work is to be successful"), but he then attacks likely criticisms and concludes:

The facts presented in this book can only be rejected by two categories of people – those who have not read it, and those who have read it but do not understand it. Such people are the worst critics, because their judgment is based not on knowledge but on ignorance. They seek not the truth but support for what they already believe. Hence their mental inertia and tenacious resistance (p.341).

Evidently Krafft could not imagine that a proper test could be both impartial and negative. The Poisson test can test the distribution of events in time, but examples are not common in astrology. Here is one from Rolf Daneel, *Archiv für Psychiatrie und Nervenkrankheiten* 22, 23-25, 1977, who wanted to know if some birth dates had more suicides than others. He analysed suicides from Nordrhein-Westfalen in West Germany, which had birth dates for 2860 suicides in 1971 and 2609 suicides in 1972. Range of birth years was 1894–1953. If some birth dates have more suicides than average (no need to predict which dates), the distribution of suicides will differ from a Poisson distribution, where each suicide is an independent random event.

The expected number of days on which x suicides are born is $N e^{-M} M^x / x!$ where $N = 21915$ days (the number of days in the birth years 1894 to 1953), $M = (2860+2609)/(365+366) = 7.482$ suicides per day on average, $e = 2.71828...$ and $x = 0, 1, 2, \dots$ suicides per day. Here Daneel's results are compared with those expected for a Poisson distribution:



7.7.1975.1 A new self-test for astrologers

Herman de Vos, *Astrologische Uitdaging: 100 jaar na Carl Gustav Jung* [Astrological Challenge: on the centenary of Carl Gustav Jung 1875-1961] 1975. The author is a biologist and president of the Flemish Astrological Society. Includes sign interpretations based on Jungian typology and a vague account of how he correctly guessed 16 sun signs in 50 trials, then correctly predicted his own planet signs, a clearly suspicious feat given their invalidity.



The author points out that comparing chart readings with case histories is difficult because it usually involves subjective judgements. He suggests it would be better to (blind) compare one case history with four charts that are roughly three months apart, so each comparison has a 1 in 4 chance of being correct. The binomial probability of m hits in n tests is then $p = n! / (m!(n-m)!) \times 3^{(n-m)} / 4^n$, which he suggests converting to an insight coefficient IC analogous to IQ, where $IC = -\log_{10}(p) \times 10$. For 3, 5, 7, or 9 hits in 10 tests, $IC = 6, 12$ (chance), 25, or 45. Astrologers should practise until they "achieve remarkably high values" (p.169). **Comment** But they didn't. His self-test is a matching test, and the mean of 70 tests to date equates to a chance IC of 12, see 8.6.1

7.7.1975.2 Attitudes of astrologers towards science

David B Black. The attitude of astrologers to the scientific establishment. *Cosmology Bulletin* Number 3, 9-21, 1975. Black is described by the *Bulletin* editor as one of the few astrologers who can unite the technical and spiritual. His division of attitudes into 3 broad groups remains as valid today as it was more than 40 years ago. The 3 groups are:

(1) Little concern with science or scientific questions, and no interest in connecting astrological truths with those of modern science.

Their unconcern for science seems an omission only to an outside observer; from within, there is no feeling that something is missing or that something important is being ignored. These people sense that something in modern science is essentially antagonistic to what they find in astrology, and avoid science the better to preserve what is important to them (p.9).

(2) Concern with scientific *data*. When astronomers discover a new body within the solar system, astrologers rush to assign a meaning to it. When geneticists find that genes determine human characteristics, they immediately claim that astrological meanings have a genetic basis.

Scientists of the establishment ridicule astrology because it has nothing of its own to say. To them, the astrologers merely follow the scientists around and excitedly assign "meanings" to what scientists discover. [Yet] scientists can pile "fact" upon "fact" without a murmur of disapproval from the fact worshippers (p.11).

(3) Concern with scientific *method*. The aim is quantification, the devising of testable ideas, the tendency to believe that something is real if it can be reduced to numerical quantities.

A natural concomitant of the worship of quantity is a heavy reliance on statistics as the means for the acquisition and verification of knowledge. And statistics is the method of choice for measuring quantifiable characteristics of a group of individuals whose individualities one wishes to ignore. It is not often appreciated how wide is the gulf which separates such group knowledge from the knowledge of individuals (p.12).

The author recognises the positive aspects of science such as its discipline and organisation, without which astrologers tend to fall prey to simple likes and dislikes. He also recognises that most astrologers see themselves in the first group. Nonetheless:

science *must* be met and conquered. And people in the first group are not about to do it (p.10, his italics).

Nor are people in the other groups because they are misguided. They have tendencies that:

sacrifice the valuable essence of astrology to the hope of acceptance by the scientific establishment, and that even should that hope be fulfilled, the astrology that would gain acceptance would not be worthy of the name. ... I maintain that efforts made to fit astrology into current scientific thinking (as opposed to adapting science to the service of astrological study) work against the preservation of the essence of astrology (p.13).

To support this view he quotes the examples of parapsychology and psychoanalysis, which (thanks to the scientific approach) are now compartmentalised as one speciality among many. At Harvard an attempt to fuse all human sciences into a Department of Social Relations failed, and there are now separate departments of Sociology, Psychology, and Anthropology. But:

Astrology is not a "speciality" -- ... it pervades and unifies our study of the various eddies and backwaters of the flow of existence. ... there is something in our culture, especially insofar as it is pervaded by science, which makes this sort of unified, deep approach to astrology difficult (p.17).

He points out that astrology works, not because of actual celestial influences, but because it allows two viewpoints based on the world at large (the macrocosm), and the human being (the microcosm). Which of course have to be the same thing:

If astrology *really* has something to offer the world, then astrology had better demand that science undergo some fundamental changes before it [astrology] is incorporated into it. ... If astrology is worthy, it should have a transforming effect both on us and (eventually) on science. It should open our eyes wider to the very structure of the world, not merely add some new phenomenal correlations to an already overlong list. ... The real substance of astrology *can* be found by anyone, by anyone whose higher, unmanifest self is ready for it to be found (pp.18,19,20).

Comment Apart from the author's failure to distinguish between descriptive and inferential statistics, the issues boil down yet again to facts vs meaning. The many tests in this book have repeatedly shown that, in personality, behaviour, and everything else, Virgos are no different from Leos. In factual terms they are identical. But in meaning terms they are very different. You are free to choose one or the other. You are not free to confuse them, or to conceal your choice, even though both are common in astrology books.

If you now re-read the above summary you will see how easily Black obfuscates rather than clarifies. He appeals to a vague *transforming* or *opening of eyes* or *real substance*, never to concrete examples of these things, and never to ways in which his claims could be explored or tested. In effect he is talking in riddles. Which may suggest that the real enemy of astrology is not science but clarity. If like Black we see astrology as larger than the limitations of science, we are discarding all restraints in favour of anything goes, where nothing can be tested, all claims no matter how ridiculous have equal status, and an impenetrable fog of confusion makes discussion futile and progress impossible. Which of course some critics might see as a good description of astrology today.

Ironically in the same issue is a review of *Recent Advances* by Kennet Gillman, previously the editor of *Kosmos*, an English statistician living in New York with more than twenty years of experience as an astrologer, and thus also one of "the few who can unite the technical and the spiritual". His attitude to science is the exact opposite of Black's. He says *Recent Advances*:

has made an important first thrust at the Gordian knot of unquestioned belief that stifles Astrology. [It] has dragged a large bundle of warm, comforting, astrological truisms out into the cool light of objective examination. Not a few bubbles of hot air get deflated in the process. ... By quoting the opinions of many of today's leading astrologers, side

by side, on specific topics, [it] not only emphasizes the various differences that occur on all subjects but also just how inept are those who eagerly make authoritative statements on all and every subject, usually without any evidence. ... I fully recommend this book. [It] has attempted much and fulfilled a very great deal indeed (pp.105, 108).

7.7.1975.3 On not being bothered by facts

Garth Allen, *American Astrology* April 1975 pp.18-21. Garth Allen was the pen name of Donald Bradley (1925-1974), one of the US champions of empirical research. His article criticises opposite views. Here are verbatim excerpts.

In the past few decades our subject has been gradually subverted into a mere psychological system which functions effectively only in proportion to the degree of wooziness that is brought to bear upon it. Advocates of the "subjective" or abstract approach are people who characteristically deplore the use of the scientific method to arrive at usable information. ... it is, for some weird reason, a threat to our subject (p.18).

It was only to be expected that those who cling to abstractionism and the supposedly mystical would yelp in protest against what they consider "materialistic" spoilers of the good thing they've had going for themselves for several decades now. Their protest has taken the form of discourses against the use of facts and figures to ascertain the truth of the matter. ... it is one of those old standbys of both journalism and pseudo-sophisticated conversation whereby a smokescreen of oh-so-standard clichés and digressions usually succeeds in masking *what really matters* (p.18).

In the field of astrology, where there is as yet no policing of viewpoints, no canon laws to break, no penalties for telling even the most bald-faced of lies, this problem of egoism in opposition to truth is particularly acute. In our field the disparagement of statistics is apt to be due more to face-saving than fact-finding (p.19)

If [astrological influences] are not distinguishable through a competent statistical approach to their study, then [we must conclude] they simply do not exist! All of the philosophical arguments to the contrary go by the board, because if this is not so, then astrology is the big lie its enemies claim it to be. ... There are a lot of people in our field who will not allow themselves to be bothered by the facts (p.21).

Comment Twenty years later, in a letter to *Correlation* 15(1), 62-63, 1996, long-time UK astrologer Ronald Harvey exemplifies the contrary case. Apart from being misleading, his opening statements add nothing to the debate because they also miss the point:

Scientists are programmed a priori to see astrology as nonsense. ... science itself is grounded ultimately on belief, and firmly held beliefs are notoriously difficult to overrun. ... In my book *The Spindle of Meaning* [1996] ... there is a chapter on the impossibility of any conclusive proof, but I hope it will stimulate further enquiry and a desire to discover what astrology might be capable of revealing.

The point is that all this boils down to yet another case of facts vs meaning (which is not to imply that one is necessarily better for you than the other, see 4.8.5).

7.7.1977.1 Historical developments in harmonics

Mark Feldman. Harmonics in astrology: An interview with Cambridge Circle. Dell *Horoscope* 65(12), 10-11 & 29, Dec 1977. This interview with the founders of harmonics was at a time when harmonics promised to revolutionise astrology by expanding its underlying number symbolism. Empirical results suggested that astrological significance lay less in traditional ideas (signs, houses) and more in the interval that defined them, in this case 12. What mattered was the interval in relation to 360°, ie its harmonic, and its area of application (zodiacal, diurnal, aspectual circles) where previous differences were now unified. This summary is much abridged. Feldman begins with a brief introduction:

Harmonics attempts to explain astrology scientifically. It has led to the founding of a research organization known as Cambridge Circle Ltd of Green Bay, Wisconsin whose aim is to develop "a broadly-based science of cosmic cycles and periodicity". Its senior members include former president of the AA John Addey, current president of the AA Charles Harvey, and eminent US mathematician Dr James Williamsen. The three were interviewed separately by mail expressly for *Horoscope* magazine and their answers were edited by this writer to represent the response of the organization. [The interview date would have been around or just before mid 1977.]

MF: What is the difference between harmonics and traditional astrology? **CC:** Traditional astrology has no conceptual framework so it is difficult to examine its how and why. If it really does work then the universe must be structured in such a way that makes this possible. We are attempting to determine this structure and thus explain how and why astrology works.

MF: Are any assumptions necessary? **CC:** Not really. Our empirical findings lead us to believe that all astrological principles are essentially wavelike and that the universe is essentially mathematical in its structure, which then gives meaning to numbers.

MF: Is this not tenuous ground? **CC:** Not to anyone who believes that the cosmos and the universe are essentially rational. There is no obligation to accept this, but number seems to be the key to understanding why different harmonics have different characteristics. Harmonics allows one to see the way in which any particular number works in a specific chart.

MF: Should it be approached from a strictly scientific standpoint? **CC:** No. While astrology should be shaped by empirical science [ie by controlled observation] it must also evolve as a system of metaphysics. This way we can bridge the gap between science and metaphysics.

MF: Do you think the astrological community will accept this? **CC:** Harmonics is simply an attempt to make astrology more coherent and intelligible. Once developed it will be a tool that will tell us far more than is currently possible about any birth chart. Perhaps within ten years harmonics will be moving into the very center of astrological thinking.

MF: What do you see for the future? **CC:** It will bring a restoration of the real tradition of astrology in all its richness. Astrology will be restated in terms of harmonics, or whatever they become, and this will be the new traditional astrology.



MF: Will the data compiled by Cambridge Circle be analyzed by outside parties? **CC:** Most of the data are accessible and we would love to see someone else analyze them. Independent researchers welcome.

James Williamsen (1941-1988) in 1976. For Addey and Harvey photos see 7.7.1997.2.

Comment At the 1971 AA Conference in Cambridge John Addey was presenting his findings under the title *Astrology Reborn*. Charles Harvey was in the chair, and James Williamsen – who was taking time off from his fellowship at King's College – was in the audience. Afterwards they got together and formed Cambridge Circle, named after its birthplace.

A year after Feldman's interview the idea of harmonics was criticised in the same magazine by US astrologer Richard Nolle (Is there a hole in harmonics?, *Dell Horoscope* 66(11), 34-37, Nov 1978). Nolle had found a problem – of the 15 articles in their 1976 book *Harmonics Anthology* only one used controls. It was based on random birthdates that ignored the effect of demography (more births in summer) and astronomy (sun spends 6% more time in Cancer than in Capricorn), which could have caused most of the claimed significance. Therefore:



Attempting to clarify this matter, I wrote Dr James Williamsen at Cambridge Circle, enclosing tables and calculations to illustrate the point. When I had waited the better part of six months without receiving a reply ... it seems safe to conclude that a reasonable measure of doubt surrounds the basic statistical studies which gave rise to harmonic astrology (p.37).

The Cambridge Circle subsequently published John Addey's *Harmonics in Astrology* 1976 (also published by Fowler the same year) and James and Ruth Williamsen's highly technical *Astrologers' Guide to the Harmonics* 1977. Also shown are Addey's *Astrology Reborn* 1971 (published by the AA in 1971, see 7.7.1997.2) and *The Discrimination of Birthtypes in Relation to Disease* (republished by the AFA in 1975). *Astrologer's Guide* cost \$18.50, which few astrologers could afford, the last \$2.75.

Unknown to Nolle his doubt was supported by findings in *Recent Advances* 1977:149, where the decisive question was: are significant harmonics reproducible? Gauquelin planetary effects suggested that harmonics in the diurnal circle were reproducible, except later work showed they had little to do with harmonics, see 6.9 ff. But work for

Recent Advances had uncovered large sets of sun degree totals in the zodiacal circle reported by Carl Payne Tobey in *American Astrology* during 1937 that could be compared with the corresponding sun degree totals reported by John Addey (which had led Addey to the idea of harmonics in the first place). This was a decisive event for harmonics because the results showed that neither amplitudes nor peak positions were significantly reproducible:

From p.149 **Correlation r between amplitudes of first 60 harmonics and between 360-degree totals**

7302 UK doctors vs 6877 US doctors	-08	.10	Mean difference in peak positions ^o measured forwards from 0° Aries of 1st 60 harmonics ± std deviation.
7302 UK doctors 1956 US doctors	-03	-09	
6877-1956=4921 1956 US doctors	-06	.00	
1974 UK clergy 7012 US clergy	.02	-.18	
1974 UK clergy 2492 US clergy	.10	.18	
580 UK polio 443 UK polio	-02	-.11	
Mean	-01	-02	89 ± 52

Controls (unlike sets)

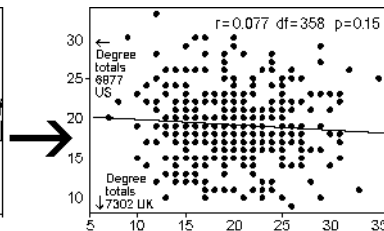
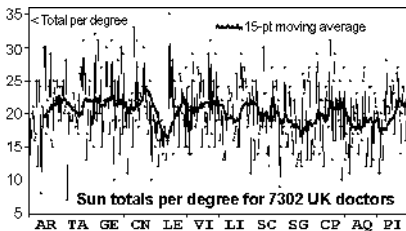
7302 UK doctors vs 6318 US bankers	-04	.14	
7302 UK doctors 7012 US clergy	-02	.16	
6877 US doctors 6318 US bankers	.11	.19	
6877 US doctors 7012 US clergy	.20	.39	
1974 UK clergy 1968 UK random	.01	.02	
2492 US clergy 1968 UK random	.08	.09	
580 UK polio 512 UK random	-02		
443 UK polio 512 UK random	-05		
Mean	.06	.16	
			85 ± 53

Controls (sets vs sub-sets)

6877 US doctors vs 1956 US doctors*	.46	.42	
7012 US clergy 2492 US clergy**	.21	.27	
1023 UK polio 580 UK polio*	.75	.49	
*Sub-set	Chance	.00	
**Independent sample	r for p=.05	.10	90 ± 52

UK data from Addey (either published or by personal communication if unpublished), US data from Tobey's articles in *American Astrology* Jan-Dec 1937, harmonic analyses by Colin Bishop, for details see *Recent Advances* 1977:143-152.

The correlations for sets vs subsets (bottom) are very significantly positive and is due either to data common to both (doctors, polio) or to demography common to both (US clergy). But the correlation between independent like sets (top) is insignificant and no different from that between unlike sets (middle), so there is no support for the existence of harmonics in the zodiacal circle. The diagrams below from 7.7.1997.2 shows what seems to have happened:



Left: The moving average for 7302 UK doctors exhibits what seems to be clear wavelike properties. Voila, harmonics! But contrary to our new-found expectation the degree totals show no correlation with 6877 US doctors. Our perceived waves were actually noise.

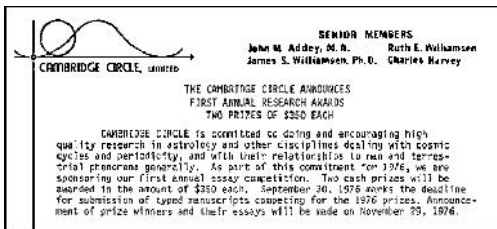
The above findings appear to have had no effect because four years later a long positive article on harmonics by Williamsen in *AFA Bulletin* 43(8), 250-260, 1981 contained no reference to them, thus providing further support for Nolle's reluctant conclusion. It begins with this stirring tribute to astrology that, by illustrating how a scientific mind can become enthralled with astrology, seems worth reproducing in full:

Throughout the years that I have been involved in the study of Astrology, I have been singularly impressed by the richness of its tradition, its teaching, its symbols, and even more so by what I believe is the future potential of this discipline. I am a firm believer in the idea that astrology must, above all, strive to be a science in the fullest and best sense of this word. I do not believe there is anything magical or obscure, or irrational about the idea of astrology. I believe that its truths, whatever these may be, are capable of empirical test. I believe that its speculations, when based on sound principles, can and will match, or even exceed, those insights and leaps of understanding which the past century has shown us in biology, physics and psychology (p.250).

Williamsen then introduces arc transform charts, which are harmonic charts calculated as usual but based instead on harmonic number = $360/A$, where A = degrees between any two planets. They are said to allow any separation of any planetary pair to be analysed in depth.

On the other hand, they challenge the assumption that only integral harmonics are valid, and they generate so many charts that almost anything can be explained. Thus for ten planets you get $10C2 = 45$ pairs of angular separations, therefore 45 extra charts per natal chart, all of them different from the 45 generated for the next birth chart on your list. Add another ten bodies (easily done these days) and you get a total of $20C2 = 190$ extra charts per natal chart. Furthermore there seems to be no reason why an arc transform based not on $360/A$ but on $360/(360-A)$ should not be equally valid, thus doubling the number of extra charts. But even to an astrologer this level of largesse might seem a touch over the top.

Nevertheless Williamsen finds arc transform charts to be "extremely useful" with "unusual interpretive power" (p.259), presumably in the same way that increasing the number of clouds increases the chance of seeing the face you want. So it is of interest that in his obituary of Williamsen in *Correlation* 7(2), 35, 1987, Charles Harvey describes him as one of the finest minds in astrology, a brilliant mathematician whose work in artificial intelligence had led him to believe in the existence of universal mind. It was a subject to which microcosm-macrocosm connections seemed relevant, hence his interest in astrology, where his chance attendance at John Addey's lecture had introduced him to harmonics as an apparently decisive concept. Except a simple lack of controls had led everyone astray, see also 7.7.1997.2.



In 1975 Cambridge Circle announced its first annual essay competition with 2 prizes of \$350 each, one for contributions to harmonic theory such as a survey of traditional concepts, and one for contributions to harmonic applications such as case studies in disease or personality. There were no formal requirements re length but 5K-10K words was a guide. Standards would be very high and intentions to enter had to be submitted by 21 May 1976 (from *Cosmology Bulletin* 1975 last page). It is not known whether entries were received.

7.7.1978.1 Is theory better than experiment?

Demetrio Santos Santos, *Investigaciones sobre Astrología* [Research on Astrology] 1978. A massive two-volume work in Spanish totalling 1026 pages, no index but a lengthy list of contents.



The blurb states "There are two ways to truth: by theory and by experiment". In this book it is theory (here logic, speculation) all the way. There are no empirical tests except for 5 vague pages citing Gauquelin. Vernon Clark tests are not even hinted at, but there are 16 pages on the horoscope of Jesus (mostly about Pisces) and an 851-item bibliography of mostly Spanish titles (256 before 1500, 728 before 1800, 55 after 1935, 25 after 1970). It is of little practical value to researchers, and (as is normal in astrology books) has

no index. Despite which reviewer Al H Morrison in *Astrological Review* 47(3), 37, 1980 called it a scholarly "Spanish equivalent of *Recent Advances* ... without the opinions of junior astrologers posing as savants, plus a more coherent historic review and perspective. Excellent!"

7.7.1978.2 Are astrologers actually doing real research?

Rudolf Smit, *Tijdschrift Astrologie* 2(2), 5, 1978.

Agrees with the view in *Recent Advances* that "Most of what has been published as astrological research is not research at all [it is just the uncritical examination of birth charts]; and most astrologers are pitifully credulous about "results" that appear to support astrology" (RA p.7). For an account of Smit's personal experience of "most astrologers" see 2.1.

7.7.1978.3 The pecuniary perils of being a true disbeliever

Karsten F Kröncke, *Dokumentation über den Ausgang der DM 10,000 Wette* [Outcome of the DM 10,000 challenge]. With help from *Der Spiegel* 20 Feb 1878, *Welt am Sonntag* 5 Mar 1978, & Peter Niehenke (personal communication).

DM 10.000,-

zahle ich dem Astrologen, dem die Lösung der folgenden elementaren Aufgabe gelingt: bei 5 von mir ausgewählten Paaren von Menschen, die sich durch gegensätzliche Eigenschaften unterscheiden (Beispiele: Landstreicherin und Chefssekretärin; Gewohnheitsverbrecher und Geistlicher), allein aus dem Horoskop jeweils den »Versager« und den »Normalen« herauszufinden.

Damit ist jedem Berufsastrologen Gelegenheit gegeben, öffentlich zu beweisen, daß die Astrologie tatsächlich zu leisten vermag, was sie Rat suchenden Menschen täglich verspricht.

Interessenten können die genauen Einzelheiten dieser Wette über meinen Verlag anfordern:

Hoffmann und Campe Verlag
Herrn Professor Dr. Hoimar v. Ditlefurth
Harvestehuder Weg 45
2000 Hamburg 13

Notice in *Welt am Sonntag*

[World on Sunday] 5 March 1978. It says:

I will pay DM 10,000 [about \$US5000] to the astrologer who is able to successfully meet the following elementary challenge: given 5 pairs of people selected by me who are distinguished by contrasting natures (such as vagrant vs chief secretary, habitual criminals vs clerics), you have to pick the "failure" and the "normal" using only their birth charts.

Thus every professional astrologer has the opportunity to prove publicly that astrology can actually do what it promises to do every time a client seeks their advice.

Interested parties can request the exact details of this challenge through my publisher:

Hoffmann und Campe Verlag
Herr Professor Dr Hoimar von Ditlefurth
Harvestehuder Weg 45
2000 Hamburg 13

In the 1970s Dr Hoimar von Ditlefurth was a famous German physician and science journalist. He was a good presenter and made very popular TV shows about science. One of his shows broadcast on 14 November 1977 dealt with astrology, but he tried in an unfair way to show it was nonsense – he asked an astrologer to give a chart reading for a known person but deliberately gave the wrong chart, which the astrologer noticed and complained about. Since one in every two adult Germans believed in astrology, Ditlefurth's actions created much public animosity. He said "As a scientist I cannot believe anyone can be honest and intelligent and also be an astrologer", yet "never in my 14 years in television have I been so attacked and scolded".

So on 4 April 1978 he held a TV discussion forum with prominent astrologers Reinhold Ebertin, Heinz Fidelsberger (a proponent of the scientific approach, see 7.7.1978.3), and Karsten Kröncke (b.1943, a proponent of the Hamburg School). Ditlefurth demanded scientific proof of astrological claims, but in vain. So he offered DM 10,000 (then about \$US5000) of his own money to any professional astrologer if they could successfully match the subjects in five pairs of charts, each pair being born close together in time and having contrasting natures, provided they pay a DM 1000 entry fee. Ebertin and Fidelsberger said it was not possible (Fidelsberger

largely because Ditlefurth's chart – he was born 15 October 1921 at 10:30 pm in Berlin with SO-135-UR orb $<1^\circ$ – showed him to be "absolutely stubborn"), but Kröncke said yes, he could do it.

Dr Ditlefurth (the chart is not his). From *Der Spiegel* 20 February 1978.



Later Ditlefurth decided that five pairs were too open to chance effects, so he proposed instead to give ten charts all mixed up. Kröncke said he hadn't agreed to such a test because it would take too long. But he had publicly agreed to the original test as notified in *Welt am Sonntag*, so he asked Ditlefurth four times to issue the original test. But Ditlefurth complained to the media that Kröncke was reneging, which was not true. So Kröncke took him to court. On 12 June 1978 the District Court of Freiburg issued an injunction against Ditlefurth to stop him claiming the test "was not carried out because the applicant withdrew for spurious reasons", and imposed a fine of DM 10,000 plus costs. For each subsequent offense the penalty would be DM 50,000. The test never went ahead.

Comment Had it gone ahead it would have equalled the 1983 \$5000 superprize in 8.9.10.2. Ditlefurth's refusal was unfortunate because tests since then suggest that the chance of winning was not good (always assuming that none of the charts were known to the participating astrologers, or they would not conspire to submit all $2^5 = 32$ possible matches), see 8.6.1.

7.7.1978.4 Over 70% hits for classical astrology?

Wolfgang Dobereiner, from a 129-page "Document about Astrology" (in German) sent to HJ Eysenck in 1978.

In 1978 Wolfgang Dobereiner was a German teacher of traditional classical astrology based in Munich. Among other things his document describes a voluntary test of his curriculum made after a year of two evening classes a week, to which 14 of his students had responded. The test consisted of five birth charts, from which the students had to answer questions such as which chart is the writer, which chart is the artist, and what kind of company.

Some questions led to disagreeing answers. For example the question "what kind of company is shown by chart 5" (it was the chart of a film rental company) was attempted by 10 students, whose answers were adult films (twice), and once each for alcohol producer, burial club, car company, church related, marriage institute, movie rental, and pimping.

But for other questions the hit rate was often over 70%, which Dobereiner saw as proof of classical astrology and therefore of interest to Eysenck.

Comment The document included copies of the student's answer sheets. Usually they were without signifiers, giving only the chart ID as an answer. But the question asking which chart is the artist (which also happened to receive the most hits, namely 11 out of 13 (85%) vs 2.8 expected by chance) had three answer sheets with signifiers for artist, which were:

Sheet 1 – SO in 5th house in SG, UR in 3rd house.

Sheet 2 – UR in 3rd house.

Sheet 3 – UR in 3rd house, SA in 12th house.

So all three agreed on UR in 3rd house. But this is not enough to explain the hits (obviously those who have UR in 3rd – around 1 in 12 of the population – do not end up as practising artists). Instead it suggests that Dobereiner had chosen his charts to fit tradition (or at least his curriculum) so he could mark the answers more easily – after all, if he had picked a chart at random from a group of artists, it would not necessarily match what he taught, so it would be hard to tell if students were following his teachings, especially as most gave no signifiers. One correct answer to a question about who the writer was (it was Thomas Mann), showed that the student knew the chart already, maybe because it had been used in class.

The test may be a test of Dobereiner's curriculum using charts chosen by him, but it is hardly a valid test of astrology. Without the students' response sheets, the underlying problems would not be apparent, thus leading us astray. If nothing else it shows how a detailed description of a test is essential if its results are to be properly assessed.

7.7.1980.1 Some problems in astrological research

AHM Strack van Schijndel, *Astrological Journal* 22(4), 215-221, 1980. A talk originally presented in Paris in 1978 that thoughtfully summarises the research situation as it was in the late 1970s when hopes of success were high.

The author (1922-2009) had a good understanding of astrological research and had made a few studies of his own. He begins his survey of 1970s research problems by stressing that:

I do not think at all that astrology can be explained by science. Science provides us with a clumsy approach, just as medical science provides us with a clumsy approach to a human being, ... So rest assured that all the way I am aware not only of the value, but also of the limitations of astrological research. When we go into the criticism [of research], we find that in twenty centuries not much has changed. The opponents of astrology state that the results of astrology are vague to such an extent that everyone can recognise himself in almost any horoscope (p.215).

But in recent years computers have changed this vagueness because they offer us:

the possibility of handling so much data that we can evaluate the results with the methods of science, eg statistics, and in this way we can convince even the scientists. ... In my opinion, it is certain that astrology will develop during the next decades very extensively, and it is almost unimaginable that official science can [stop this] (p.215).

The author sees a successful replication as essential for eliminating coincidences because the chance of accidental agreement is very small. A repetition is therefore "an absolute condition and we are not allowed to make conclusions on the basis of our first investigation" (p.216).

But there are problems. (1) Our subjects may differ too much, as when actors can be divided

into serious roles and comic roles, so we may never have enough information to form a truly homogenous group. **(2)** The same trait may arise from different chart factors, such as ME-0-SA and ME in CP, so we may never have enough subjects for proper testing. **(3)** Differences from a control group will automatically exist unless it is precisely matched demographically and astronomically. And even then its selection means it will have something in common not shared by the test group, which could lead to wrong conclusions.

Finally **(4)** the test group may be too limited to allow the proper expression of a given chart factor, for example a fair test of conjunction X would require it to occur in every zodiacal degree, so we may never have enough subjects, certainly not enough subjects whose personal characteristics (such as attending clinics) are the same. In any case, one isolated factor alone never has severe consequences. The author concludes that researchers must be "more cautious in judging the results of their investigations in groups of limited size" (p.221).

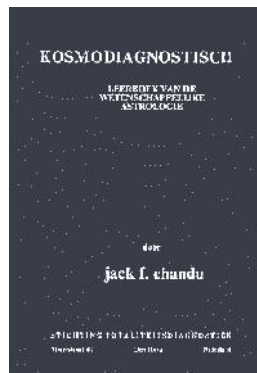
Comment In other words astrology may be too complicated to be studied scientifically. But if that were true, it would also be too complicated for astrologers to know that it works. The author cannot have it both ways (but he was right about the development of empirical tests). The problems he raises, and the implied argument that judging a birth chart may be too subtle a process to be tested scientifically – an argument that can occupy astrologers for several pages – is effectively dealt with by Eysenck and Nias (1982) in just one paragraph, see 8.4.1.

German psychology professor Ulrich Mees looked at what a "failure to replicate" might mean (*Astro-Psychological Problems* 1(3), 27-29, 1983). He concludes (as does Strack) that replication has little meaning unless the original conditions are sufficiently repeated. He adds:

For the readers who are psychologists, such a debate is not new: it reminds us of lively discussions about the merits of clinical [ie personal case study] versus statistical judgements in psychology (p.29).

That was in 1983. Today the merits of clinical vs statistical judgements have been empirically tested in more than 200 studies with a clear outcome in favour of the latter, see 8.9.2.2.

7.7.1980.2 My 30 years of research on chart factor meanings



Jack Chandu (1925-1994), *Kosmodiagnostisch Analyse Systeem* [Cosmic Diagnostic Analysis System] 1976, research results updated 1980 in English by the author (13 A4 pages) for private pupils only. He was a prolific author not just of astrology books including individual sun signs but also of palmistry and graphology books. He was one of the few modern astrologers who tested astrology scientifically, albeit in the days before hidden persuaders and modern personality tests, and had visited many countries usually by sea. He rejected tradition and always researched claims for himself. Inevitably his results tend to be eclipsed by more modern findings, but they remain a shining example of what every astrologer should do before charging a fee but never does. So read this summary less for its results and more for its account of the state of astrology in 1950-1980 and for the rigor of the author's astonishing labour.

My research started in 1947 with the works of fifty prominent authors on astrology. Later I included the most important works up to 1979.

Reliability of birth information

All writers pointed out that the time of birth must be correct up to the minute. But in practice it rarely happens that one looks at a clock of known accuracy at the moment of birth and immediately writes down the time. Usually the time of birth is guessed afterwards. The birth times of children found in family bibles or baby books are mostly unreliable. Yet they are the best source of information for older people. Civil registers in Holland and some other European countries usually round birth times to half an hour or (at later dates) a quarter hour. Very seldom are they given to the minute. From official sources I know that very often just any time was filled in by the public officer, because the happy father who came for registration didn't know it, or had drunk too much. Even a wrong *date* can be registered due to superstitious reasons or because the birthday of another family member was just one day before or

afterwards. I have several such cases in my files.

I have found it best not to trust too much the memory of aging mothers, especially if they have had more than one child. There are countries in which no time of birth is registered. A further complication are the different time-changes such as summertime, especially during WW2 when people were reluctant to use the time imposed by the occupying forces and stuck to their own time. All we can say is that it is usually impossible to find an exact time of birth. So can rounded times be improved by rectification?



Techniques of chart rectification

The various authors recommended three major techniques of chart rectification based on using (1) rules of obscure origin, (2) the prenatal epoch, (3) important events in the life. I tested the first two using ten exactly timed births obtained via a friendly nurse in a maternity hospital. All were natural births, not induced. I tried to find the true time starting with an arbitrary wrong time, but in all cases the results differed by up to three quarters of an hour from the true time, even when I started with the true time!

I tested the third technique with the help of some older astrologers with grown-up children. They had recorded the birth times of their children rather exactly because it was then quite common to have births at home and not in hospitals. Diaries, photo albums, and saved letters helped to verify the month and often the date of important events. I had 10 cases, and in 7 of them I was able to find the time of birth within four minutes. (I also found that the first cry seemed to be the right time of birth for astrological purposes rather than the emergence of the head or the cutting of the umbilical cord.) But in practice this technique is often not usable because there are no important events, or they are not remembered accurately – mistakes of several months are common. So supposedly rectified times are in most cases only a fiction.

Interpretation of chart factors

All the traditional astrology books I consulted used at least the following chart factors: signs, planets, major aspects, and houses. Signs and planetary positions give no technical problems. With aspects there is disagreement about orbs. Houses are worse, with no agreement on the house system to use. There are also many doubtful ideas and inventions that are promoted by some astrologers and refuted by others. But despite their disagreements the books showed much similarity in the *symbolic* meaning ascribed to basic factors.

My biggest problem was putting symbolic meanings into everyday language. One can define a symbol by using many words and still miss its essence because symbols have to be devoid of value judgements, which makes tests difficult because many common words are emotionally loaded. Also some meanings have changed, and some are now lost. Many astrologers follow a certain school of psychology but different schools can use the same word for different things. For example *valid* can mean *objectively true* or *subjectively true* (it is *valid for me*).

Testing chart factor meanings

My first task was find words for the meaning of each factor that would not be misunderstood by the ordinary person, thus making it possible to understand combinations of factors. The idea was to find clear meanings, not the only possible right meanings! So I experimented for more than thirty years to find clear meanings using 100 subjects between 21 and 65 years old who were willing to help, and who had a birth time from family records or a birth certificate.

Each subject completed several personality tests, all except one (the MPI, an early version of the EPI) being projective tests. The subjects also received a list of 100 character traits taken from the 200 “important characteristics of character” described in Otto Junge’s 1949 book *Rationale Graphologie*, each with examples of their everyday use to make their meaning clear. Their task was to choose which traits were applicable or not applicable to themselves. The lists

were also given to five acquaintances of the subjects (close friends or relatives) who had to decide how well each meaning fitted.

The results of the five personality tests showed that each covered its own field but did not describe the total character. The proportion of agreement in mutual areas was about 77%, which was enough for my purpose. I then translated the test results in terms of the 100 traits and compared them with the ratings given by the subjects and their five acquaintances, using only those traits on which at least four of the five acquaintances agreed. The agreed traits averaged 72% of the total. The proportion of agreement between the three sources was:

	Acquaintance views	Subject's own views	
Personality tests	83%	59%	) Caution: See
Acquaintance views		66%	) Comment below.

I concluded that neither personality tests nor acquaintances give sufficient information about how someone sees themselves. I then compared the meanings of the planets in signs and in major aspects (orb 5°) excluding the conjunction, all in terms of the 100 character traits (which was not difficult to do), and compared them with the three different sources. The proportion of agreement between the meanings and each source was:

Personality tests	Acquaintance views	Subject's own views	
61%	56%	68%	) See Comment below.

The results were not encouraging, so I repeated my tests with 50 new subjects chosen in the same way. The results were much the same. So these methods were not suitable for checking the meanings of chart factors. **Comment** The meanings he found were published in his 1977 book *De astrologische analyse: Een studie en werkboek* for further testing by others, so he does not repeat them here. But his use of projective tests (all popular at the time but now discredited as valid measures of personality), and his lack of controls for hidden persuaders, means that today these meanings have only historical value. **End of comment.**

But older books speak about the "innate and unchangeable character of a person", an idea that became obsolete at the end of the 19th century thanks to advances in psychology. Could they be referring to the hereditary part of our character structure? To test this idea I discussed it with the subjects and their acquaintances and found that many of the astrological meanings seen as being incorrect were once seen as being correct. For example a person could become more tolerant as they got older. I concluded that the birth chart shows that part of our genetic structure which later develops into "character", or what we refer to as a person's "nature".

But what about the idea that traits cannot exist if not shown in the birth chart? We can try to prove the contrary by seeing if any of the not-yet-tested chart factors fill the gap. So I looked for the traits attributed to a certain chart factor or combination of factors (such as minor aspects, planets in houses, the ruler of a house in another house) against each of the 100 birth charts. At the same time I checked to see whether these new traits contradicted the ones already known to be true. All this took many years to complete. In general 21% of missing traits could be accounted for, which would be encouraging except that, of the traits attributed to the new chart factors, (1) 17% were not clearly present, (2) 30% were obscured by true traits, (3) 32% were positively untrue. In other words, against that encouraging 21% (of which a large proportion could be due to chance) the remaining 79% was wrong or at least very doubtful. I concluded that traits acquired after birth cannot be seen in the natal chart.

Next I tested the importance of each type of chart factor:

Sidereal zodiac

I compared 17 different sidereal schools mostly from India and found they gave different positions for the starting point of 0° sidereal Aries covering nearly 15° between them, yet each claimed to be the best. I calculated three birth charts (including my own) according to these 17 different schools, but none gave results better than using the tropical zodiac. Of course one

cannot validate any system using only three cases, but for the research described here it was sufficient, and I decided not to use the sidereal zodiac.

Signs

Some authors argue that sign meanings must be reversed in the southern hemisphere, for example sun sign Aries should be interpreted as sun sign Libra. I was born in Batavia (now Djakarta, capital of Indonesia) in the southern hemisphere at 5S, lived there for 21 years and was in touch with local astrologers, which proved to me that the claimed reversal is invalid. In my files I have hundreds of charts of clients born in Indonesia, Australia, or South America, and without exception they all show that the reversal is invalid.

Some older textbooks suggest that the influence of retrograde planets is very weak. I found this to be true in only 19% of the cases I examined, and even then in a mostly unclear way.

Major and minor aspects

I found little difference in strength between a trine and a square. The conjunction worked quite strongly, the opposition a little less. The sextile was quite weak. Minor aspects were weaker, the strongest being 45° and 135°, but still weaker than the sextile. The 72° and 144° aspects were even weaker. Minor aspects are subject to disagreement about their meaning (eg whether harmonious or inharmonious), they increase the number of factors available for interpretation (so *any* conclusion can be drawn), and they usually obscured true traits. In many cases the deciding factor existed outside of the birth chart such as an event occurring after birth. Nevertheless for the sake of clarity I suggest not using minor aspects. I support the old Dutch saying “Restriction shows the master”.

This research also showed that many of the statements found in astrology books are absolutely false. For example only 29% of the charts of 5000 known homosexuals and bisexuals had a Venus-Uranus contact (said to indicate homosexuality), which was less than the 37% in a heterosexual control group! So most astrology books are not useful for serious astrologers.

House systems

Everyone claims their house system is the best even though each gives different results. So I tested ten different house systems using my 100 subjects to address three key points:

House system	% of cases with true results	% not explained by other factors	% of true traits negated by houses	
Alcabitius	44	4	11	
Campanus	27	3	15	
Equal houses from Asc	66*	12*	16	*Asterisks mark the top four in each column
Equal houses from MC	69*	15*	19*	
Koch	57*	13*	19*	
Morinus	35	9	16	
Placidus	63*	14*	17*	
Porphyry	41	5	11	
APC (Dutch Ram school)	36	7	22*	
Regiomontanus	42	6	9	
Mean ± standard deviation	48 ± 14	9 ± 4.2	16 ± 3.9	
sd as % of mean	29	48	25	

The results show that we lose too much (% of true traits negated by houses) for the profit gained (% not explained by other factors). So, until proven otherwise, it is better to avoid houses and their problems in polar regions than to use them and arrive at wrong results.

Hypothetical planets

Currently there are about 25 hypothetical planets each with its own ephemeris. I tested ten exactly timed birth charts against each of the hypothetical planets given by Witte and by Ram see 5.3.1], and found nothing that could not be explained by existing aspects and planets in signs. However they did give much unclearness and often positively wrong indications when used in combination with existing factors. The same was true of another German hypothetical

planet Transpluto, and of the Moon's nodes and Part of Fortune, so they were best ignored. I found some support for conjunctions and oppositions to midpoints, but not for other aspects, provided the orb was very small, certainly not over 1° .

I also tested many of the other much-debated chart factors such as parallels, distance values, and degree symbols, but found nothing to justify doing further research on them.

Comment 2 Sadly the author's astonishing labour over more than thirty years 1947-1980 is clouded by a lack of statistical tests and control groups, and by advances in related areas such as personality tests and hidden persuaders, that inevitably reduce its value. Nevertheless it provides a sobering example for astrologers who feel that such work is not needed, or is impossible without funding, or is not desirable in the first place. It shows what can happen if you try. For more on the author see 7.4.1990.1 and his obituary in 7.7.1994.6.

7.7.1981.1 Astrology as an enchanted religion-science hybrid

Denise Newton. A sociologist examines organised astrology. *Astrology* 55(4), 129-135, 1981 and 56(1), 7-16, 1982. She sees religion, broadly defined, as containing rules for its application, whereas science has no such rules.

The Astrological Lodge, founded by Alan Leo in 1915 as a branch of the Theosophical Society, was organised around astrology as a religion that links the *above* with the *below* via a spiritual essence that is knowable only via its manifestations. It requires followers to apply astrology to the whole of their lives all of the time. It works by symbolism related to essence, not by symbolism related to matter, so it cannot be disproved by ways related to matter such as science. In 1936 the Lodge organised the first UK astrological conference with 250 in attendance.

In due course two groups broke away from this religious fixation, the first in 1937 to form the Federation of British Astrologers aimed at professionals [its first president was Wm J Tucker, in 2000 it changed its name to 21st Century Astrologers and folded in 2002]; the second in 1958 to form the Astrological Association aimed at developing a more scientific approach with no place for an essence unless it could be made visible. The clearest exposition:

of this position comes in ... *Recent Advances in Natal Astrology*, which I consider to be an impressive undertaking. ... its position is somewhat extreme ... but the majority of [AA] members share its general direction of emphasis (p.134).

The focus is on what works, except what works for me may not work for you, so it is distant from science and closer to religion. Newton sees this hybrid as arising from the commercialisation of astrology, in effect "an enchantment of the world at the level of the individual while ... organisationally disenchantment of the world proceeds ... a curious contrast" (p.15).

7.7.1981.2 Astrology and the philosophy of science 1

RN Parisious and PM Curry, Of babies and bathwater: A philosophy of science for astrology, *Astrological Journal* 21(3), 154-158, and 21(4), 202-207, 1979; M Shallis, Astrology and science, *Astrological Journal* 22(1), 42-47, 1980; PM Curry, Astrology and philosophy of science, *Correlation* 1(1), 4-10, 1981, and personal communications 1980-81.

In a response to *Recent Advances* (1977), Parisious and Curry (1979) argue that astrology is about patterns, about wholes, so the examination of isolated factors (as in *Recent Advances*) is "uniquely inappropriate ... and unscientific" (p.203). Shallis (1980) puts it this way:

Do the stars and planets [causally] influence our personalities and behaviour? ... Or is astrology a way of describing some underlying, non-physical, non-rational reality? ... [The last] can be shown to work by doing it, by experiencing it. We must convince the sceptics that if they try it *on our terms* they may find the 'proof' they seek *on their terms* [as in *Recent Advances*] will at best be wafer thin (pp.44, 46). [ie forget tests, trust your experience]

Curry (1981) argues that astrology is in urgent need of good research, which in turn requires a good grounding in the philosophy of science (his speciality), because:

astrology has been 'muddling through' the last three-hundred-odd years. Its tradition, already borne down with the weight of venerated inconsistencies, is presently threatening to sink altogether under a proliferation of new ad hoc 'theories'. It may stay afloat, but that is hardly progress! (1981:5).

He points out that in order to progress, astrology needs scientific evaluation, not more appeals to experience. But the philosophy of science governing what researchers accept as evidence is

problematic when it focuses on individual factors rather than patterns, so the importance of meaning, symbolism and things not directly observed may be missed. Or as he later puts it:

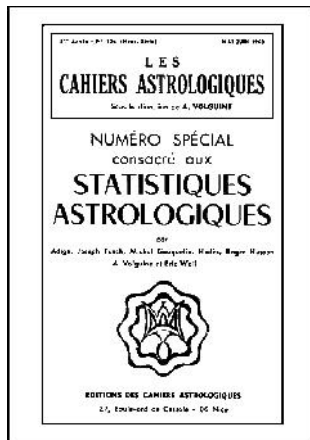
people cannot live by facts alone. They must and will have meaning, whose relationship to facts, while intimate, are a great deal more complex and problematic than [this approach] recognizes (*An aporia for astrology*, 1983:5.8).

In practical terms the problems boil down to testing groups rather than individuals, and to treating chart factors as objective facts rather than as things with subjective meanings.

Comment The problems were true of *Recent Advances* (1977) only because it was a review and relevant studies were rare. Today there are many more tests of individuals, albeit with negative results (see examples cited below). Also the testing of meaning under conditions dominated by hidden persuaders is not without problems. In effect the field has become the quantitative vs qualitative argument in 4.4.2, which has been eroded by the continuing failure to obtain evidence commensurate with astrological claims. See also 7.7.1994.1.

But Curry's point is supported by the current fashion for analysing very large samples, as in 7.7.2016.4, which could hardly be less relevant to chart readings made face-to-face in consulting rooms. The more relevant testing of *performance* one-chart-at-a-time is less fashionable, possibly because it gives negative results that are harder to dismiss, see 7.2.1987.4 and 8.6.

Unfortunately, having emphasised patterns, Curry et al never describe suitable tests. In effect they accept astrology as a given, and then argue round in circles on the basis of its assumed properties rather than its observed properties. To put subjective meaning before objective facts is of course a legitimate personal choice, see 11.4, but is essentially a retreat into solipsism, the view that only our own experience and existence can be known with certainty.



7.7.1982.1 Statistics are nothing new

By 1982 several new research journals had been founded to specialise in the scientific approach and the application of statistics to testing astrology. But such an approach was nothing new. As shown in 5.13, statistics had become increasingly prominent since their introduction was pioneered by the French researcher Paul Choissnard in the early 1900s.

◀ For example in 1968 this special issue of the French astrology journal *Les Cahiers Astrologiques* [Astrological Reports] featured statistical studies by nine French researchers including Gauquelin. In those days it was evidence of a strong interest in research by astrologers generally. Today that interest has almost disappeared and indeed is generally resisted, for example see 7.7.2001.1.

7.7.1983.1 Astrology and the philosophy of science 2

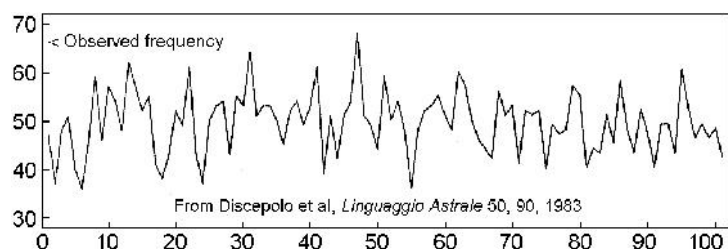
Wout Heukelom, *Wetenschap & Astrologie* 7(1&2), 2-15, 1983.

A critical review with 39 references of (1) research methodology, (2) results from the recent research literature such as *Correlation* and *Recent Advances*, and (3) articles on the philosophy of science. Most skeptics see astrology as obviously false, and most believers see astrology as obviously true, so both groups see research as pointless! In between are the people such as NVWOA members who see astrology as urgently in need of scientific research to resolve the issue. This research requires skill and an understanding of the philosophy of science, especially Popper's idea that science makes progress only by falsification, which guides how research should be performed and how the present state of research should be assessed. Traditionally astrology has a non-physical explanation (symbolism), but in principle it could have a physical explanation. Either way it needs statistically significant results to be credible, but current areas of interest (sun signs, harmonics, accidents, Nelson's radio findings, matching tests) do not

seem promising. Only the Gauquelin work represents real progress. Even so, there seems little hope that results commensurate with the claims of astrology will be obtained. So it seems unlikely that further scientific research into astrology will contribute anything new. **Comment** This conclusion was confirmed by the subsequent 36 years of research as described in this book. It has usually been conducted by supporters keen to verify the claims of astrology, not by debunkers keen to destroy astrology, so it cannot easily be dismissed.

7.7.1983.2 Test your skill at detecting harmonics

Ciro Discepolo, Michele Mauro, and Fausto Passariello, *Linguaggio Astrale* 50, 68-95, 1983:90.



The Italian researchers *Ciro Discepolo et al* present this plot as part of their study of planetary heredity effects in a sample of 5018 families. It shows strong periodic waves. Should we conclude that it

shows strong support for astrological harmonics? No, because this is their control plot showing the distribution of 5000 random numbers, 1–100, for which $p = 0.85$ vs chance. The apparent waves are an illusion.

7.7.1983.3 Is the whole chart more than the sum of its parts?

Peter Niehenke, *APP* 1(2), 29-32, 1983.

Among astrologers counting numbers in astrological research is controversial because it has been misused by prejudiced critics. But prejudiced astrologers have also misused their art. Whole charts do not make individual factors meaningless. But if each factor were actually meaningless, then adding together a thousand meaningless factors is still meaningless:

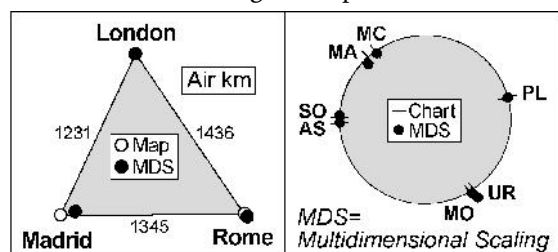
[Thus] the horoscope may be too open to any interpretation whatsoever, because of the multiplicity of its components. Such a danger became recently clear to me when, in three publications, I saw three different horoscopes of John Lennon (based on three different birth times), all the three indicating "definitely" Lennon's sudden death! (p.31).

We should accept the usefulness of counting for improving our knowledge of rules that work.

7.7.1983.4 Analysing astrological research data by MDS

David Stevens, Multidimensional scaling of celestial data, *Correlation* 3(2). 13-21, 1983 and 4(1), 39-42, 1984.

MDS or multidimensional scaling is a computerised mathematical technique for converting a matrix of *differences* into a visual map of *original positions*, like making a map of an unknown country from a matrix of distances between pairs of cities. Astrological data is input to MDS as the cosines of the angular separation between all possible pairs of bodies (cosines convert the angular separations to the linear equivalent of distances between cities).



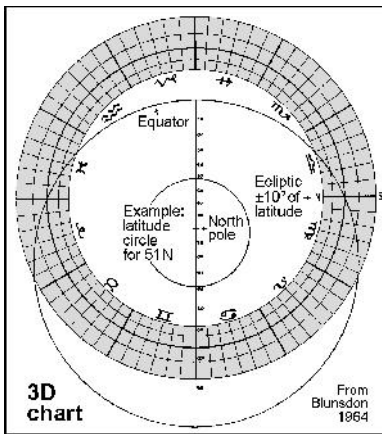
Left: MDS of distances on a map recreates the original map with minor differences due to uncertainties in air distance measurements and the distortion inherent in map projections. **Right:** MDS of birth chart positions (here simplified to make it easier to follow) maintains the original angular separations although minor differences from an exact circle may appear.

MDS is similar to factor analysis in using a similar process of iteration to home in on the best solution, and in allowing the results to be plotted as a scatterplot in two or more dimensions (more than three dimensions is obviously problematic). MDS differs from factor analysis in not needing a matrix of correlations (the matrix can be of anything such as distances), in allowing variables to be weighted, and in having a simple "stress value" to help choose a solution. The stress value is a measure of the fit in N dimensions between the solution and the original data,

and for each N it is a number between 0 and 1. Values below 0.1 indicate a good fit and a reliable solution. A value of 1 indicates that the dimension is redundant and not needed.

MDS allows data subsets such as outer planets vs inner planets of any group of charts to be individually tested to determine their relative contributions to the total (the result identifies the group's most stable characteristics). MDS can process many variables simultaneously, does not require assumptions about the underlying distributions, and has potential for the analysis of astrological data combined with batteries of tests administered to large numbers of people.

Comment The aim of MDS is to simplify a complex matrix, so anything more than a 3D result is rarely useful or comprehensible. The apparent potential of MDS (just shovel in the data and out will pop the most relevant factors) will not be realised unless there are clear signals in the first place, which if they existed would already be detectable by non-MDS means. Also MDS, like factor analysis, can still give a "result" even with random numbers. So adding data may merely drown any signal in noise. After all, astrological connections are not like distance connections between cities. Which is probably why the author's promise of "further news, results permitting" (p.42) received no follow-up, at least not in *Correlation*, nor by researchers elsewhere. MDS routines are available in many statistical software packages such as SPSS and Matlab.



If your interest is mainly about the information that is lost when the three-dimensional heavens are reduced to a traditional two-dimensional chart (for example a planet with latitude can be in one house while its ecliptic longitude is in another), perhaps the most successful design showing both longitude and latitude is the 3D chart designed by UK astrologer Norman Blunsdon, *Astrological Journal* 6(2), 5-9, 1964 and 8(3), 20-27, 1966. Planets are inserted in the greyed area at their longitude and latitude. House cusps (any system, any location, none are shown here) can be drawn without reference to tables but tables make it easier. His 3D chart is an excellent teaching tool but is largely unknown outside the UK, and in any case is usually too tedious (or at least too unfamiliar for people wanting astrology as usual) to be popular for routine readings.

7.7.1983.5 Some problems of replication

Ulrich Mees, Remarks about the problem of replicating astrological results, *Astro-Psychological Problems* 1(3), 27-29, 1983. The author is a professor of psychology at the University of Oldenburg. He has an active interest in astrology and was one of the eight judges in the \$5000 Astrology Superprize for the disproof of artifacts, see 8.9.10.2.

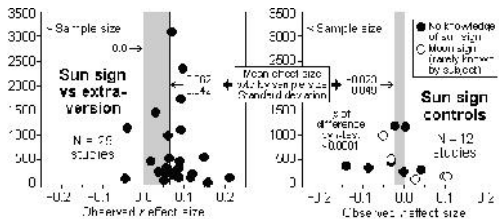
Mees points out that in science no observation can be taken seriously unless it has been replicated by independent observers. Until this happens there is no guarantee that the observation is not due to (1) faulty procedures, (2) variables other than the one hypothesised, (3) chance, regardless of the observed *p* value, (4) vested interests or wishful thinking. He comments:

For those who admit the uncertainty of falsifying the expected result on the basis of only one unsuccessful replication, there are however strict methodological rules to follow for avoiding a gullible acceptance of any casual deviation to the mean. As far as possible, (1) the number of conditions should be stated in advance, (2) their theoretical effect should be precisely stated (p.29).

In other words, just one successful or unsuccessful replication may not be enough to support or reject the original observation. The reason for obtaining the observation must be such that only A produces B without the possibility that C also produces B – a point that is especially relevant in astrology where the same outcome can be linked to many different chart factors.

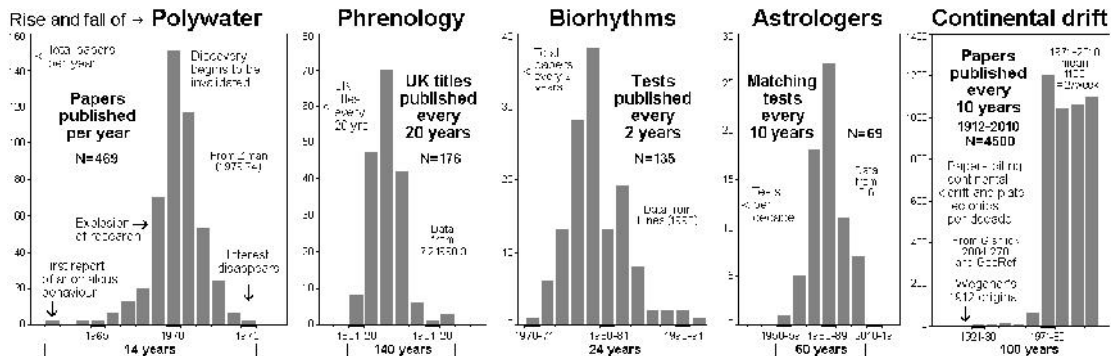
Comment Most (but not all) of the results in this book are in need of replication. Those that have been replicated to date involve only tiny effect sizes that are either (1) not usefully different from zero (tests of astrologers, tests of clients) or (2) explainable by artifacts (self-attribution, planetary effects). Tiny effect sizes always need large samples for their reliable detection and show a large scatter due to sampling error, which means that many replications (not just one or two) will be required before we can be sure about what is happening. Do we

really want to know the answer or do we want to impose our pet views on the universe?



For example here is astrology's most replicated effect (sun sign self-attribution from 8.3.7). $N=29$ studies give a tiny mean effect size of 0.062 plus a large scatter in the results. Look closely at these two plots – it is easy to see why a single result cannot be trusted. Only when we have many results (including controls) by different researchers can we be sure the effect is genuine. But as noted above, nearly all the results in this book do not meet this requirement.

To understand what this means in practice, look at the plots below of various ideas that were initially widely accepted or rejected, and how they fared when subjected to replication:



Left: In 1962 a Russian physical chemist reported strange results when water was condensed in glass capillaries. It had a high viscosity that suggested a new form of water – he called it polywater – that led to research involving over 400 scientific papers and some millions of dollars-pounds-roubles of effort. But the strange results were due to impurities dissolved from the glass, and within ten years interest had disappeared. The claim that only A (water) led to B (polywater) was overturned because C (dissolved impurities) also led to B. **Middle three:** To maintain interest the effect must be worth it and must be replicable, which explains why tests of phrenology, biorhythms, and astrologers went the same way as tests of polywater – initially a steep rise of interest was followed by a failure to replicate and an equally steep decline of interest. The claim that only A led to B was overturned because C (hidden persuaders in each case) also led to B. **Right:** But when the claim replicates, as for Alfred Wegener's initially rejected idea of continental drift, critics change their mind. Interest rises steeply and shows no sign of declining. (The actual shape and numbers depend on the search terms and how they are combined but the outcomes are generally the same.) Note the huge difference in shape and numbers from the other four – if their claims had replicated then interest would not have declined. In each case N is the total number of plotted studies. Differences between time spans largely reflect the availability of tests and of researchers motivated to apply them. Thus labs worldwide had the motivation and equipment for testing polywater (short time span) but not phrenology (long time span). **Sources** from left: J Ziman, *Reliable Knowledge* 1979:74. This book 7.2.1998.6. TM Hines, *Psychological Reports* 83, 19-64, 1998:25-29. This book 8.2. AD Gishlick, *Journal of Scientific Exploration* 18(2), 275-282, 2004:278 and the GeoRef database.

Mees's point about the importance in astrology of variables other than the one hypothesised also applies in **medical research**, where a given symptom may have many different causes.



Relevant here is a famous study by epidemiologist John Ioannidis (Why most published research findings are false, *PLoS Medicine* 2(8), e124, 2005, 6 pages). He points out that in medical research a finding is more likely to be false than true:

when the studies conducted in a field are smaller; when effect sizes are smaller; when there is a greater number and lesser pre-selection of tested relationships; where there is greater flexibility in designs, definitions, outcomes, and analytical modes; when there is greater financial and other interest and prejudice; and when more [researchers] are involved in a [competitive] scientific field in chase of statistical significance (all quotes are from his first page).

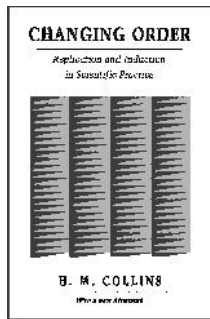
His computer simulations of most study designs (which in medical research are generally more rigorous than in most astrological research) show that claims of positive results are more likely to be false than true, which is largely due to:

the convenient yet ill-founded strategy of claiming conclusive research findings solely on the basis of a single study assessed by formal statistical significance, typically for a p -value less than 0.05. Research is not most appropriately represented and summarized by p -values, but, unfortunately, there is a widespread notion that medical research articles should be interpreted based only on p -values. [For more on this in astrology see 7.7.2016.3]

As an example, he suggests we imagine a research area in which there are no true findings to be discovered. All effect sizes would then (in the absence of bias) vary by chance around zero, so claimed effect sizes would be merely a measure of the prevailing bias (as in publication bias or when researchers are unwilling to accept that there is nothing true to be discovered). [In effect this is merely a fancy way of stating the obvious]

Ioannidis suggests that one corrective is adequate replication, and that before making any tests researchers should make a thorough survey of existing studies and their effect sizes (ie a meta-analysis) to estimate their chance of testing a true rather than a non-true relationship.

Alternatively they could estimate R for their area of interest, where R (not to be confused with the R of R^2 in a regression analysis) is the ratio of true relationships (usually one or a few) to the relationships that could be hypothesised (usually a large number that in medical research may be thousands or millions), so R is always < 1 . The probability that the tested relationship will be true is $R/(R+1)$, and will be much reduced if the findings from which R is estimated have been biased by selective reporting.



Most published findings in medical research involve low or very low values of R , again suggestive of researchers being unwilling to accept that there is nothing true to be discovered, which is why most findings are false.

Sociologist HM Collins (*Changing Order: Replication and Induction in Scientific Practice* 1992) points out that when experiments involve skilful attention to multiple variables, it can often be unclear whether a second experiment has been done well enough to count as a replication. But once proper consensus has been reached (and this may take years or decades) the replicated outcome is accepted as established knowledge:

If there are still dissenting voices then they are seen to belong in a quite palpable way to scientific non-persons; these are persons who, because of some individual pathology, are unable to accept the "truth". The ferment of creation [ie the focused interest of *discovery* as opposed to *application* as later in plate tectonics] is then virtually irrecoverable.

For those who have experienced the discovery and consensus, dissent becomes:

one of temporary aberrations in the norms of scientific deportment. Once the scientific truth is known it is forgotten that non-experimental and "non-scientific" negotiating tactics were necessary if closure was to be attained (p.152).

That is, the tactics necessary outside the lab to secure a replication, as might be needed for example to find out details that an opponent with vested interests might wish to suppress.

Comment All of this is true of astrology. There is also a useful analogy here with prospecting for gold. For most people there is the exciting lure of finding a fabulous nugget. But they need to know where to look to avoid finding out the hard way that there is no gold to be found. No sensible prospector for gold ventures forth without first becoming geologically informed.

On this basis very few astrological researchers qualify as being informed about the extent and results of research. Up until *Recent Advances* in the late 1970s they could justifiably plead ignorance because the existing research had been so difficult to locate. But today the internet and books like this one have made it much easier. Nevertheless astrologers generally remain either uninterested or dismissive, see 5.21. For more on reproducibility see 7.7.2015.3.

But should anyone be surprised? After all, why should astrologers bother with research when their personal experience is seen as an unproblematic arbiter of Truth? ie a truth that conveniently justifies their dismissal of any evidence that might question their experience. Such a situation could never survive in science. For more on experience see 7.2.1998.5-6.

7.7.1985.1 The super-duper path to proof of astrology

Al H Morrison, *CAO Times* 5(4), 43, 1984. 6(1), 40, 1984. 6(2), 47, 1985. 6(3), 43-47, 1985.

Morrison is strongly opposed to the various prize competitions organized by Geoffrey Dean and Arthur Mather during 1980-1984 for evidence in favour of sun signs. He is especially opposed to their \$5000 superprize launched in 1983 (with twelve sponsors including the AA, ACS, AGS, ISAR, Matrix and RA) for evidence that astrology cannot be explained by non-astrological factors such as hidden persuaders, see 8.9.10.2. He is opposed because:

So far as reported, none of the entries has actually achieved anything (5(4) p.43).

at least not in positive terms. Indeed, it was clear to Morrison (1916-1995) that:

Dean simply does not understand what we do in astrology, or cannot accept the reality of astrology (6.1.40). Since there has been debate on the question of whether the contests of Geoffrey Dean PhD are unwinnable, we did some unscientific opinion survey, and came to the finding that the Geoffrey Dean PhD contests are MOOT [ie meaningless] in that the firm guaranteeing payment of the prize is but a pen-name of somebody who could not pay out such sums, in any case (5(4) p.44). [Morrison was evidently unaware that the superprize had numerous reputable sponsors]

Which led him to announce (to the tune of *Mountain Greenery*) that:

All this Geoffrey Deanery / Clutters up the scenery / Can't see stars for looking at numbers
He and his statistics can / Knock down every mystic man / Though they don't enliven our slumbers (6(2) p.4)

His answer to Dean and Mather's \$5000 Astrology Superprize was "The Alternative Geoffrey Dean PhD Space Age Bonanza Super-Duper Prize(s)". To win a \$10 prize you must:

prove or disprove the validity of some language used in an extensive printed literature (5(4) p.43).

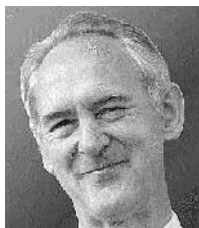
An entry "Astrology as Poetic Text" was received from UK astrologer Martin Budd. It argued:

Since astrology is a language, then proving the validity of language in general amounts to the same as proving astrology. Hence I take the contest seriously (6(3) pp.43-47). [Note how he assumes what he wishes to prove].

7.7.1985.2 When interest in research was at its peak

Michael Startup, *British Journal of Social Psychology* 24, 307-315, 1985. Gives the results of his work on aspects as reported in his 1984 PhD thesis at Goldsmiths (see 7.6.1984.1) for which Hans Eysenck was the external examiner. In the UK this was a time when interest in research was at its peak following the publication of *Recent Advances* in 1977, the start of AA London Research Conferences in 1979, and the launch of *Correlation* in 1981. So Startup's involvement with AA activities (picture 8.1.1) when its focus on research was stronger than today, and his use of modern methods including meta-analysis, makes his work of particular interest. Here we look at his comments on the state of research.

Startup begins his paper by quoting recent opinion polls in the UK, France, Germany and USA that found about a third of the population believe in astrology:



A social phenomenon of this magnitude deserves the attention of social scientists and, indeed, much research has already been devoted to explaining belief in astrology in terms of the social conditions, and the psychological characteristics of believers. However, the validity of astrology has yet to be adequately investigated. It is true that there have been many investigations of the claim that individuals differ according to [their sun sign] and that no acceptable evidence for this claim has been found ... but there is more to astrology than this (p.307).

Startup (1950-2015) when Professor of Clinical Psychology at University of Newcastle NSW and joint editor of *British Journal of Clinical Psychology*. He had lost all interest in astrology.

Houses had been tested, mostly by Gauquelin, with conflicting results. Aspects had been less tested but the limited results were also conflicting, So for 562 university students and 349 astrologers or students of astrology, total 911, he made tests of 32 aspect pairs between SO through MA and MA through PL (selected by consensus among astrologers) involving hard vs soft aspects and angular separations of 15° multiples with the first centred on 0°. But in a total of 121 tests of predicted links the outcomes were no better than chance. Startup concludes:

The three studies reported here were designed to test all of the ideas concerning aspects that currently enjoy the greatest support among astrologers. Since no evidence of validity was found, although the statistical tests had adequate power to detect tiny effects, there must be considerable doubt whether the astrological doctrines have any basis in reality. There must also be doubt whether the few positive results that have been reported by previous researchers represent real effects rather than chance findings. ... Belief in astrology in modern times appears to owe nothing to the observation of actual behaviour (p.314).

7.7.1986.1 Committee for Objective Research in Astrology

From notices in *Correlation* 6(2), 6, 1986 and APP 5(1), 4, 1987. What follows is unabridged.

The aim of the Committee for Objective Research in Astrology (CORA) is primarily to act as a source of reference for people intending to carry out research in the field of astrology or cosmobiology. Surveys of the published literature, such as Eysenck & Nias *Astrology Science or Superstition*, usually dismiss many published research results because of methodological and statistical errors that could easily have been avoided. Thus CORA exists in order to help prospective research workers to discuss their plans in advance, so that possible mistakes in planning and execution can be avoided. Astrologers and others planning to do research in this area should communicate in the first place with the Secretary of CORA (Françoise Schneider-Gauquelin, BP 317, 75229 Paris, France), who will then contact any members particularly well qualified to deal with the queries involved.

CORA also exists to answer questions concerning the value and limitation of published research, and to advise those who seek guidance in respect to published work in this area. CORA aims to give a unified sense of direction to workers in a field that is particularly difficult, and one which combines expertise in astrology, astronomy, psychology, statistics, research design and many other areas in a unique manner which makes it a particularly difficult area to do research in. The membership of CORA combines expertise in these various areas, so that we feel some degree of confidence in our ability to answer queries of one kind or another. CORA's Chairman is Professor Hans Eysenck of London University and its Vice-Chairman is Professor Martin Fiebert of California State University. Its Scientific and Technical Advisors are Professor Marcello Truzzi, editor of *Zetetic Scholar*, Professor Victor Benassi, Dr Zipporah Dobyns, Mark Pottenger, Robert Hand, Neil Michelsen, Thomas Shanks, Michel Gauquelin, and Dr Geoffrey Dean. Its Critical Observer is Professor Ivan Kelly, of the University of Saskatchewan, who is chairman of CSICOP's Astrology Sub-committee. **Comment** CORA was publicised in astrology journals worldwide. But despite its line-up of experts it received few enquiries, most of which did not proceed further. It did not survive Eysenck's death in 1997. In 2016 www.objectiveastrology.org announced CORA#2 (Center for Objective Research in Astrology) with ambitious mission statements (to search for truth without compromise using the scientific method) but so far no names or useful details.

7.7.1986.2 A warning to astrologers about scientific tests

Carol S Mull. Encounter with Academia. *Journal of Research of the AFA*, 3, 49052, 1986. Or why astrologers from the Indiana Federation of Astrologers failed a test they had helped to design, see 7.6.1992.2. "This article is meant to be a warning to those astrologers who may be asked to submit to testing by the scientific/academic world" (p.49).

The astrologers had originally reacted with enthusiasm:

We were confident that we would be successful and really *do something* for astrology. It sounded so easy! (p.49).

They had agreed on the following notice to appear in the *Bloomington Herald Tribune*:

Just over 30? IU psychologist's study needs you. About 35 volunteers with various backgrounds are needed to participate as part of a psychological study being conducted at Indiana University. Persons willing to participate in free personality and vocational interest testing should be American native-born adults 30 or 31 years of age (p.49).

The restricted age range was to prevent age cues leaked by the subjects' photographs:

There were no restrictions in regard to what I asked on my [69-item] questionnaire, but ... I had to choose between no photographs at all, or all the subjects near the same age – I chose the latter. In the end ... we began the task of matching twenty-three sets of test results, photographs, and questionnaires, with twenty-three computerized charts. We thought it would be easy, but quickly found that it was not. Nevertheless, each astrologer worked twelve to twenty-four hours on the project, and did his or her very best (p.50).

But the results of this experiment and its follow-up were worse than chance, not just in terms of getting the right match but also in terms of agreeing on the answer:

I was crushed ... The club was very disappointed, but I felt it was a good lesson (p.51).

Why was it a good lesson? Because various problems became clear in hindsight:

For example, we might have chosen a chart with a Sagittarius Sun, when the correct answer had Sagittarius on the ascendant. ... one big mistake I made was in agreeing to use young subjects (p.51).

The subjects were varied in intelligence and in vocational success (they included entertainer, factory worker, housewife, journalist, lawyer, ne'er-do-well son of a politician, prostitute, sailor, and tramp). But – and this was the crucial bit – they had:

not lived long enough to know themselves; consequently, they did not do an adequate job on my questionnaire. ... it does underline what other astrologers have learned. That is, caution must be used when dealing with scientists and academics in regard to astrology. I have looked around enough to know that other scientific tests of astrology have proven to be equally disappointing. We know astrology works, but even the Gauquelins have had trouble proving this fact to the satisfaction of the scientific community (pp.51-52).

She does not explain why, at age 30-31, the subjects were unable to do an adequate job of answering questions about their height, weight, injuries, health; and events like moves across country and deaths in the family (most of the questions were like these); or why their use requires caution even though they were selected by astrologers. But she gives this warning:

there is a body of principles and laws at the core of astrology, but these must be in the hands of a skilled and experienced astrologer who exercises capable judgement for good results. Like medicine, the law, and theology, astrology may not always give quantifiable results – but it works, nonetheless (p.52).

Comment In other words there are two reasons why her astrologers could fail a test they had helped to design and were confident of passing, namely:

- Astrology works only if clients are over 31 and the astrologer is much more competent than her astrologers.
- Astrology doesn't work beyond providing ample hidden persuaders.

Which explanation do you prefer? Hint: try applying Occam's razor (keep it simple).

7.7.1986.3 Recommendations from psychology

Jan van Rooij, *AinO* 1(2), 8-20, 1986.

The author is a psychology lecturer at the University of Leiden. The research in astrology is fragmented (no agreement on topics that deserve priority, results are inconsistent, much-needed replications are seldom made). And most research is not guided by firm astrological theory, so it is never clear how results should be interpreted. Yes, the results have not been promising. But to abandon astrology seems premature, to claim that astrology cannot be approached by science seems wrong, and to redefine astrology (as, say, a language) is never sufficiently clear to allow testing. So the author proposes a new kind of research, one that looks at *behaviour* rather than *personality traits*. For example psychologists know a lot about verbal and nonverbal communication, so a simple test could consist of recording the number of times a person speaks, for how long, and the gestures made. This requires only that astrological theory be clear about the relevant chart factors. In this way valid statements about astrology could be obtained and used for further theorising. His conclusion: Astrologers have to develop their theoretical ideas in psychological areas and do more empirical research. They have to take advantage of the fact that psychologists have successfully tackled most of the theoretical problems that astrologers now face. **Comment** Some astrologers did exactly that, as did Gauquelin, but after 25 years of improved research the results were not usefully better.

7.7.1987.1 Dr Cornelis Kuypers retires

Rudolf Smit, *AinO* 2(2), 4-16, 1987. One of our most dedicated contributors turned 73 in September 1987. It was time to focus on things other than astrology that he had always wanted to explore. In this long interview we pay tribute to our leading researcher, someone who should be a shining example for young astrologers.

Dr Kuypers was raised in an environment where astrology was not accepted. But his older brother was interested in astrology, and at age 17 the idea of a cosmic context became attractive to him. When he was 20 he was comparing astrological ideas with Christian concepts, for example the Sun was God, source of all life, but he received much criticism for his paganism. He then became interested in Theosophy, because all the Dutch astrology books of that time were steeped in it – Thierens, Ram, C Aq Libra, Suzy Parker, and of course Dutch translations of Alan Leo. A breakthrough in 1935 (when Kuypers was 21) was Ram's book on Psychological Astrology, with a novel but dogmatic emphasis on aspects and cycles, ideas that the current Ram school still hold. But he could never accept their hypothetical planets Hermes, Demeter, and Persephone [which do not agree with any of the eight hypothetical planets of the Hamburg school, see 5.3.1]. Later he left Theosophy and became more interested in testing astrological claims. But always he had to be careful to keep his interest secret, otherwise he would have been considered rather strange. Only his closest friend knew.

His early research interest was the birth chart as a source of self-awareness and human knowledge, and for understanding others. He had tried horary astrology, but the natal chart and its

progressions were more interesting for events. Later his own research on events was, for him, the most important because the results reinforced his faith in astrology. They showed that some things actually work. Nevertheless he concluded it would be thoroughly wrong to think that everything is determined by astrology. It is just one of many factors in human life.

Kuypers is well aligned with Gauquelin, who is also looking for what is true in astrology. But he disagrees with Martin Boot who, in the previous issue of *AinO*, holds that astrology is not about demonstrating scientific truths but is only a tool for providing psychotherapeutic assistance, for which you could also use numerology or Tarot. Kuypers thinks that this degrades astrology and hides some of its benefits -- Boot apparently does not care about those occasions when astrology is true. Nor does Kuypers agree with Geoffrey Dean that nothing has been proven. Yes, Dean is very strict, but he expects good correlations (effect sizes), whereas a significant result should be sufficient even if it does not allow good predictions. Kuypers has always said that an astrologer cannot predict. He can at best express an expectation:

and I never said more than that. Yes, I think my research does suggest that astrology works, but only if it can be replicated. Otherwise nothing is proven. Some people claim that astrology is not suitable for scientific research. That is nonsense. Astrology books are filled with concrete assertions that are all suitable for testing. Let me make this clear: It is extremely important that well-educated astrologers are engaged in statistical research, for only they know where to look (p.10).

He acknowledges the negative results of tests like those of Geoffrey Dean and Shawn Carlson, even though some people know very well their sun sign and behave accordingly. For this reason he expects nothing from astro-psychological research, and has worked only with concrete cases such as events. Indeed, over the past 15 years Cornelis Kuypers never believed but always tested. **Comment** At the time of this interview, important developments in research (for example decisive work on the Gauquelin data) were still a decade or more away. Sadly, Dr Kuypers died in 2001 aged 87. For a 1996 photograph see near end of 2.1.

7.7.1987.2 Computers have revolutionised chart calculations

Richard Nolle, *Kosmos* 16(1), 36-41, 1987.

Since the mid-1970s technology has made it possible for the average person to have a PC (personal computer). Today (1987) any astrologer can afford a PC as powerful as the main-frame computers used by NASA to land a man on the Moon. An off-the-shelf PC-XT takes only 1.5 minutes to calculate and print an error-free natal chart. Before computers the Erlewinés used punched-card charts sorted by metal rods to find how many had a particular factor, while my wife and I shuffled many hundreds of charts in index-card form to do the same. All of those charts had of course to be calculated by hand. Today a PC-XT will take just a day or two to do work that previously took months of exhausting painstaking brain-draining labour, yet astrologers remain trapped in dogma and tradition. We learned from books written by authors who learned from books, and so on, thus passing on a set of rules accepted more or less on faith, simply because we had no way to test them systematically. It was possible only to apply them here and there using the few charts we could calculate by hand. Today we don't have to accept this mess any more. **Comment** PCs in 2020 were many thousand times faster even than a PC-XT and could calculate a chart in a fraction of a second.



7.7.1987.3 Validation by looking at birth charts

Dennis Elwell. Subtitled "The intensive case study of astrology's tangibles". Read before the 6th International Astrological Research Conference (organised by the AA) in London, November 1987. This summary is based on Elwell's handouts at the conference.

Any failure to date to verify the claims of astrology may be due to taking hold of the task by the wrong end. In astrology any phenomenon belongs to progressively larger wholes and ultimately the entire cosmos, which then leads to direct evidence for astrology. Take the Statue of Liberty:

Dennis Elwell (1930-2014) in 1987. From AT Mann, ed, *The Future of Astrology* 1987.

Since classical times Jupiter has been linked with liberty, the statue is big (Jupiter), made of copper (Venus), has a female form (Venus), appears in the US chart (as Venus conjunct Jupiter), and so on through dozens of events and associated people. This is the kind of evidence that astrologers recognise and respect. The sheer number of links rules out chance as an explanation. This is therefore the way in which astrology's many tangibles are best verified – by individual case studies, not by statistical studies of groups. **Comment** The word "control" never appears, nor does any attempt to evaluate chance. That said, the Statue of Liberty contains more iron (113 tonnes) than it does copper (91 tonnes). So, following Elwell's arguments, we should expect the links to involve not merely Venus but also Mars. Indeed, given its marine location, one could argue for a Mars-Neptune correspondence – and one does actually exist as a square in the US chart. Yes, it's amazing! But what does it mean? Such correspondences are impossible to evaluate because we are counting hits, ignoring misses, and have no controls. To understand the problem, suppose we have been told the US chart contains Sun conjunct Uranus, aptly symbolic of its pioneering qualities. We think about it, and have no trouble in finding amazing correspondences with the Statue. For example it is:

- (1) An innovative (Uranus) national monument, resting on Sun-ruled granite.
- (2) Lit by Uranian electricity.
- (3) 151 feet high (= 1 Leo).
- (4) On an 11-pointed island (obviously Aquarius, ruled by Uranus).
- (5) Described by the sonnet on its pedestal, which reads "sunset gates ... golden door" (Sun) and the self-willed "Keep ancient lands, your storied pomp!" (Uranus).
- (6) Directly linked to the chart with its Sun-ruler (Moon) in Aquarius, ruled by Uranus.

Sun-Uranus is everywhere. What could be more convincing? Since this is "the kind of evidence that astrologers recognise and respect", it should boost every confidence in astrology – except there is no Sun-Uranus conjunction in the US chart (Uranus is 40° from the Sun and has no major aspects within 5°). So this kind of evidence is no evidence at all, just fantasy and presumption. When this example was sent to Elwell three months before his talk, he felt it was well up to his standards for a case study! But no hint of the need for controls escaped to his talk, most of which was devoted to demonstrating his Statue of Liberty correspondences. For Elwell they were sufficient to validate astrology. If you do not agree then expect astrologers to accuse you of bias, ignorance, and blatant dismissal of astrology without examination.

7.7.1987.4 Relative risk as a measure of astrological effect size

JE Becerra, *Kosmos* 16(2), 42-47, 1987. Reprinted in *APP* 6(1), 36-39, 1988, plus personal communication. Becerra is a medical epidemiologist focusing on the distribution and control of diseases in populations. He points out that statistical significance depends on both the sample size and the correlation between variables, so the latter is confounded by the former. What is needed in astrology is an unconfounded measure of the strength of the association.

Such a measure is the relative risk, given by

$$\text{relative risk} = \text{risk of X if you have Y} / \text{risk of X if you don't have Y}.$$

Thus the risk of lung cancer if you smoke is about 10 times the risk if you don't smoke, so the relative risk is about 10 (more for lifelong smokers). As explained in 8.2.4, the relative risk in Gauquelin's planetary effects is given by observed/expected frequencies in key sectors or plus zones. Thus the risk of an eminent professional being a sports champion if their Mars is in key sectors or plus zones is about 1.2 times the risk if their Mars is not in key sectors or plus zones. There is no Mars effect for ordinary people (observed frequency = expected frequency) so their relative risk is 1.00, ie their Mars sector position makes no difference to their risk of being a sports champion. For low relative risks (typically < 1.5), the statistical significance depends largely on sample size, so even Gauquelin's significant results may have no practical value. To Becerra a chart factor will be useful only if its relative risk exceeds about 2, a level based on his wide medical experience in controlling diseases in populations where the utility and effectiveness of treatments are of course overriding concerns.

Comment Three years later, in *Kosmos* 19(1), 2-4, 1990, the author complained that nobody

had heeded his advice. There seemed to be zero interest in astrology's utility and effectiveness. But after decades of research, no relative risk in astrology has consistently exceeded the levels reached in Gauquelin's planetary effects, nor have they even started to approach Becerra's suggested minimum of 2. Which suggests that in practice no chart factor in astrology is likely to be useful or effective. *Relative risk* also has the disadvantage of having no upper numerical limit, a disadvantage that can be avoided by substituting *effect size* expressed as a correlation, which has an upper limit of +1 from a zero of 0.

7.7.1987.5 Emergence of an astrological discipline

Robert Hand, *NCGR Journal*, Winter 1987-1988 [no volume or issue number] pages 66-70.

Conventional science is soulless. But astrology is chaotic, uncritical, and effectively no better. To become a mature discipline it needs to (1) define itself, (2) extend its support base to include academic research institutions, (3) improve its techniques by empirical research, and (4) evolve a theoretical framework, for example one based on time quality, with which the definition in (1) needs to be consistent. Of course we need to have faith in the astrological hypothesis but it is probably true (Gauquelin has confirmed it). The end result would be:

the creation of a new kind of science, one that addresses the spiritual as well as the physical plane. Such a science would have a positive transformative power far beyond even that of the conventional sciences and certainly far beyond any that astrology has had in the modern era (p.70).

Comment It is hard to disagree. But the necessary items (1)-(4) are nowhere in sight.

7.7.1988.1 Hey, experiments need more than skill

William E Brandt, *Kosmos* 17(4), 4-12, 1988.

The term "research" has been applied so widely that it has no single meaning. One classification is *historical* (looks at past events), *descriptive* (looks at present events), and *experimental* (tests ideas). Regardless of the type, good research is needed if astrology is to be credible. But first the problem must be defined. Seeing an old problem from a productive new viewpoint is often more important than its solution, which may be merely a matter of skill. **Comment** Thus asking if astrology *needs* to be true has turned out to be much more productive than just asking if astrology is true. The trick is always to ask the right questions, like how can astrology be used productively and ethically without involving the liabilities uncovered in this book.

7.7.1988.2 Astrology is not a science

Martin Boot, *AinO* 3(1), 52-55, 1988.

The author presents three questions together with his answers: (1) Is astrology a theory? No, it is only a technique. (2) Can astrology be a theory of something other than astrology? No, it is a technique, an instrument for symbolic thinking, the only framework that astrology fits into. (3) Can a young science provide a theory of astrology? No, because there can be no scientific basis for something as vague and flexible as symbolism. Astrology cannot be a science even though it can be tested by science. It is purely an instrument for symbolic thinking.

7.7.1988.3 Is this Europe's largest astrological library?

Wout Heukelom, *AinO* 3(2) & 3(1), 70-73, 1988. A description of the Astrological Study Centre of Dutch astrologer Roland Hepp in Amsterdam as it was in 1988.

The Study Centre is based on three Foundations, one of which, the Astrological Library Foundation, is one of the larger astrological libraries in Europe. Hepp is now setting up a computerised inventory of this vast treasure. In addition, he and his students are compiling lists of astrological factors related to specific keywords. Hepp should be congratulated for realising the importance of such work for both astrological and scientific investigations.

Comment Roland Hepp died in August 2011. His collection was sent to the Jungiaans Instituut founded 1990 in Nijmegen 90 km SE of Amsterdam but it is not open to visitors. For comparison in 1996 Michael Erlewine's famous Heart Center Library in Big Rapids, Michigan,

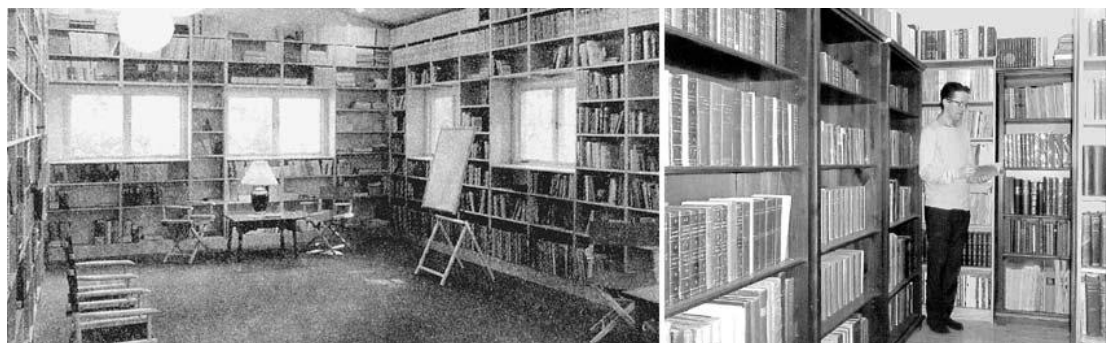


had 6000 titles and 12000 journal issues, over half of them on astrology. In mid 2013 he donated it to the University of Illinois library holding over 13 million volumes including 16,000 items related to parapsychology and the occult, especially astrology and witchcraft, all accessible to anyone on site (not just students). Its website www.library.illinois.edu gets half a million hits a week by people from around the world accessing the university's online resources.

Roland Hepp and his library in 1996 when it had over 3000 book titles

In 2014 the AA library finally re-opened 10 km west of Plymouth in Cornwall with over 6000 book titles and over 6000 journal issues (the librarian declined to reveal its current holdings when we asked). In 2017 the private collection of UK astro historian Philip Graves moved from Sweden to Wales. It has currently over 8000 book titles (175 sun sign, 300 pre-1900 including 75 pre-1800), and over 14000 unique journal issues including 1500 pulp ma-

gazines mostly US from the 1930s onwards. It occupies 220 metres of shelf space and is the largest astrological collection in Europe. It is not open to visitors except by appointment. Copies of works out of copyright (so far 1598–1894) and all the publications of Alan Leo and his *Modern Astrology* are available as paid downloads. Details from www.astrolearn.com.

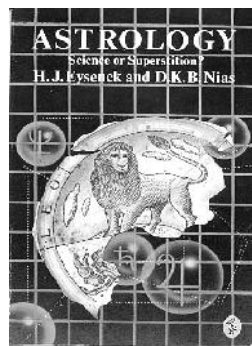


Left: Michael Erlewine's Heart Centre Library in Big Rapids Michigan in 1996. **Right:** Philip Graves and a small part of his collection near Cardiff Wales in 2019. At left nearest camera is a full bound set of Leo's *Modern Astrology*.

7.7.1988.4 Book review: *Astrology: Science or Superstition?*

Anonymous, *AinO* 3(2) & 4(1), 80-84, 1988. This review is included in a collection of reviews of 26 new books and journal articles relevant to the critical study of astrology.

Concludes that psychologists Eysenck and Nias's *Astrology: Science or Superstition?* (Penguin 1984, 244 pages) is an ideal overview of scientific studies of astrology for those who find *Recent Advances in Natal Astrology* (1977) too detailed and too technical. The review (p.84) includes this lengthy quote (from pages 223-224 of the Eysenck and Nias book) that also reflects the philosophy of NVWOA:



Do we believe in astrology? "If you wish to strive for peace of soul and pleasure, then believe", said Nietzsche, "but if you wish to be a devotee of truth, then enquire". Unfortunately both astrologers and scientists have sought rather for peace of soul than for truth, and proper factual enquiry has languished – apart from the work of a few intrepid souls, like the Gauquelins and Geoffrey Dean. We find this regrettable, and can only voice our hope that the future will see a reversal of this trend – with astrologers conceding the need for impartial enquiry, and scientists conceding the occurrence of phenomena that may well be odd but that are well enough authenticated to call for investigation and explanation [eg the Mars effect].

The shape of the theories that will finally account for all the bits and pieces of evidence we have looked at is

something we can only guess at; but that they will bring about a better understanding of nature we have no doubt. In the end, the reader who is looking for simple certainties is bound to ask, as many people have asked us: "But do you believe in astrology?" If we have achieved anything in this book it is surely to have shown that, although this sounds like a simple question, there is no simple answer. And of course the question of our belief is finally irrelevant. What matters – all that matters – is fact. We have done our best to present the major relevant facts to the reader in as unbiased a form as possible; the ultimate decision must be left to him. We have indicated the sort of conclusion we would draw from the material surveyed [ie astrology is largely, but not entirely, superstition, but we keep open the possibility that further research might change things]. It may be the right conclusion or it may not. Only time will tell.

Comment Today Eysenck and Nias's conclusion still seems correct, although "not entirely superstition" seems unlikely. David Nias is one of the compilers of the present book.

7.7.1989.1 Interview with Geoffrey Dean

Rudolf Smit, *AinO* 4(2), 2-7, 1989.

Dean and Mather, co-compilers of *Recent Advances in Natal Astrology* (1977), are currently working on an update. In this interview made in Perth WA in May and June 1989, Dean

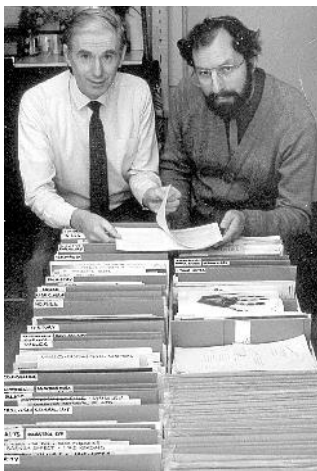


explains why they are compiling an update that will provide an exhaustive coverage of scientific research into astrology. A daunting task, which of course takes time.

Dean and Mather working on an update of *Recent Advances in Natal Astrology* in Edinburgh January 1986. They had estimated it would take five years, about the same as the original volume. In fact it took forty years (and counting). Nobody said it had to be easy. By 2020 the work had been completed and is published in the present book and as a free download on www.astrology-and-science.com.

Some of Dean's memorable statements in this interview are repeated below:

Dean and Mather's aims: All that Arthur Mather and I are trying to do is bring together the evidence to see what it is telling us, which at the moment is mostly bad news. I should add that we have no interest in whether the news is good or bad – the aim is just to get it right. *On criticisms from astrologers:* A point very often made by astrologers is that we are not doing the right type of tests. So obviously we have a deep misunderstanding of the astrological world view. My response to this is really quite simple. If we are not doing the right kind of tests, then please tell us what kind of test we should be doing instead. I have now put this question to many astrologers in print, and so far over the years I have not received any straightforward replies. It seems that astrologers are eager to criticise, but are unable to be constructive and to



the point. *On negative results and attitude:* People seem to think that we delight in negative results. In fact nothing could be much further from the truth. Continuing negative results are difficult to publish, there is nothing to win you recognition, and nobody will give you any money. So apart from wasting your time, they guarantee that you will end up starving in obscurity. To say that people like us delight in that sort of thing is rather curious. *On astrological counselling:* The helping part of astrology operates very well irrespective of whether it is true or not. *On the future of astrology:* The future of astrology will not be measured by the difference between today and tomorrow, but by the difference between this generation and the next. I think research will have more impact on the next generation than on this one.

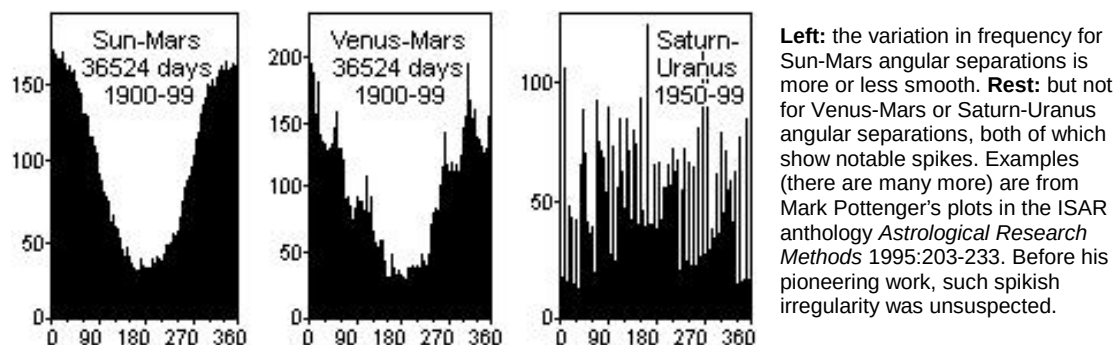
Dean and Smit in 1989 with Dean's collection of photocopies made in astrology collections and libraries around the world.

7.7.1989.2 Spikes in aspect frequencies

Mark Pottenger, *APP-NCGR* 7(2), 27-30, 1989. *Kosmos* 18(2), 20-39, and 18(3), 15-30, and 18(4), 15-34, 1989. Subsequently expanded in ISAR's *Astrological Research Methods* 1995:203-233.

All astronomical motion seen from Earth is uneven, which makes motion artifacts a constant intruder into astrological research. The earth's elliptical orbit makes the Sun spend two days longer in tropical Cancer than in Capricorn, so if we find more Cancers than Capricorns in our sample it may have nothing to do with astrology. The same for Mars conjunct Sun and Mars opposite Sun, where the former is about five times more frequent than the latter. When two or more planets are in aspect, and one or more can be retrograde, it can be near-impossible to know the expectancy with any accuracy, at least not without computers. In 1985 I and Scott Vail began a computer project to determine aspect frequencies, which a year later resulted in *Tables for Aspect Research* published by ISAR in June 1986.

As expected, the results are far from random. For example, during 1900-1999 the ME-SO separation stays within $\pm 28^\circ$, VE-SO within $+47^\circ$ to -48° , ME-VE within $\pm 74^\circ$. All of MA-VE, MA-ME, and MA-SO have a 360° range but spend around 5-6 times more time near conjunction than near opposition. The frequencies of each angular separation (rounded to 1°) generally show a broad variation plus varying amounts of spikes, as illustrated below:



Days spent retrograde are more or less uniform only for the outer planets:

	Retrograde		Direct			Retrograde		Direct	
ME	22	19.0%	94	80.7%	SA	138	34.0%	240	60.9
VE	42	7.2	542	92.7	UR	152	35.9	218	53.5
MA	74	9.4	706	90.3	NE	158	34.6	209	48.6
JU	121	29.1	278	68.3	PL	160	33.1	207	46.5

Stationery days (in principle 0) depend on precision of position

Comment The above irregularities make it very difficult to derive adequate controls, which in turn make it difficult to interpret results that depend on adequate controls. Indeed, unless birth times are very precise (within a few minutes), and effect sizes are better than tiny (rarely the case), the effectiveness of controls needs to be assessed. For more see 7.7.2016.3.

7.7.1989.3 Why science is irrelevant to astrology

Rob Hand, The proper relationship of astrology and science, *Astrological Journal* 31(6), 307-316, 1989 and 32(2), 95-103, 1990. This was the Carter Memorial Lecture for 1989 given by invitation to the AA at its annual conference.

Hand begins by stating his thesis:

The proper relationship of astrology to science is not for science to prove astrology. It does not need to be done for astrologers, and it's almost hopeless for everybody else (p.307).

He had been puzzled by how intelligent people could not believe in astrology:

I had to ask myself how could so many men of supposed good will disagree so violently with something I found so self-evident? ... they can't seem to see anything in it, and yet all of us have managed to find enough in it to dedicate various proportions of our lives, from considerable to total, to astrology (p.308).

After much thought (it "took quite a few years") he concluded that the answer lay in the difference between truth (what is so) and reality, which he defines as the rules by which one interacts with what is so, because:

it is almost impossible from the point of view of one reality system [science] to investigate another one [astrology] intelligently (p.309).

The reality system of astrology sees the universe as an underlying unity and does not assume that subject and object are separate:

the universe is a field of continua, where there is no clear boundary between any two entities. It is like a whirlpool in the water. There is no place where we can say for sure that the whirlpool has stopped and the water begun. Once one assumes the universe is like that, the answer to the question of how astrology can work becomes moot. How could the planets not affect people? They are all part of the same field (p.310). ... Our position in essence is that one cannot separate the observer from the observed because the two are a single continuous field (p.314).

In contrast, the reality system of science requires subject and object to be separable, otherwise nothing could be observed on its own. Which is why science is irrelevant to astrology, and why an alternative to conventional scientific investigation is required:

not to prove astrology, but to improve astrology. That is the key, improve, not prove astrology. We must develop our own methodology of inquiry. It may be quite different from anything that's gone before (p.99). ... We have to create a new discipline from nothing (p.100). ... The main reason I study astrology is that if it's true the deadening world view of our culture, mechanist-materialism, isn't true, and that's something the culture needs to hear (p.103).

Comment In effect Hand is saying astrology works because astrological theory says so. But by 1989 it was clear that astrology could work for a different reason (hidden persuaders were leading astrologers astray) a point that in nearly 10,000 words Hand fails to even hint at. But ask yourself which explanation for astrology is more likely: **(1)** principles unreachable by science and for which there can be no directly observable evidence, or **(2)** proven artifacts in human reasoning which astrologers (including Hand) evidently prefer to ignore.

Ironically for nearly 40 years the rear cover of *Astrology* (a quarterly journal issued by the esoterically-oriented Astrological Lodge of London), stated that:

astrology is ... founded on demonstrable scientific fact (see 8.8.8).

which according to Hand is almost impossible. But in his equally impossible chapter "Astrology as a revolutionary science" in AT Mann's *Future of Astrology* 1987:23-39, Hand says:

When I say that an individual has Mars conjunct Saturn on the Midheaven square his Uranus rising in the first house, that code contains a huge amount of information. We *know* that such a personality type has little tolerance for others' criticism, that he may have spent his early life rebelling against a repressive father figure and that he tends to be irritable in a way that expresses itself in sudden outbursts of anger (p.24, our emphasis).

As a combatant for astrology against its scientific critics, Hand will be aware that such claims to knowledge will be contested. The point is, how is this known? Where is the evidence that it is known? What independent data exists that shows that such individuals have the indicated personality to the extent required to support such claims? But he never tells us (perhaps the answer is "because astrology says so") even though he made a start in 7.7.1987.5. Astrology will never become a new discipline until astrologers desist from this kind of assailable logic.

7.7.1989.4 A self-test for proving astrology. Any takers?

Geoffrey Dean. *Astrological Journal* 31(1), 44-46, 1989. And various debates on the relevance of science to astrology.

Dean begins by describing his early experiences of astrology:

When I was a practising astrologer I had a flourishing clientele plus the usual indications of success – unsolicited letters testifying to my accuracy, millionaire clients phoning from halfway round the world, joint studies with local psychiatrists, and so on. All charts were hand drawn, all analyses were individually typed, and I did something that to my knowledge no other astrologer did – I guaranteed to return the client's money if the analysis was substantially wrong. So it was accuracy or starvation. In several hundred clients not one asked for their money back.

For clients who could attend in person, Dean would sometimes make modest predictions like:

You love jigsaw puzzles, he has a strong Saturn, she has an unaspected Mars, this daughter (and not that one) is the difficult one, next month (but not this month) will be a lot easier, and so on. It worked marvellously. I was rarely wrong.

So he was convinced that astrology works. It was this conviction, among other things, that led to *Recent Advances*, because no-one devotes serious amounts of time to something they believe to be nonsense. But he was being accused by people like Arthur Mather and John Williamsen (brother to James of the Cambridge Circle) of being sloppy and insufficiently critical. So bit by bit he introduced the dreaded numbers, the inconvenient controls, the unloved statistics and other horrors, even if it meant upsetting believers, all of which astrologers saw as scientism and irrelevant to a proper understanding of astrology:

No worries, I still got marvellous results. The only problem was that it became apparent that I was doing no better than chance – that is, it seemed that the marvels were all in the mind. All very worrying. From that time on I have refused to read charts for money. But would other minds unclouded by scientism give better results?

The self-test

So he tested astrologers, by post and in person, in many countries, for example see 8.6.7 and 7.6.1985.2. The results were sometimes statistically significant but with effect sizes too small to be useful. Nor had other testers achieved better results. So rather than pursue what was evidently an unproductive approach, he suggested focussing on professional astrologers who were highly regarded, and inviting them to do the following self-test:

(1) Nominate a test on which they are personally most confident of success. They have complete freedom to do whatever they like. (2) Nominate the rules for judgement, the test data required, the provisos that have to be met, and the results they would accept as demonstrating they had failed. (3) Submit the outcome for publication in this journal. This will ensure fair play and encourage others to follow suit. In other words each of these astrologers is invited to submit to a test of their own devising. I will then arrange for them to be tested by CORA, the Committee for Objective Research in Astrology, and for the results to be published in scientific journals for all the world to see.

He pointed out that the self-test would be the first time they would be completely free to set their own rules. And CORA would collect a suitable sample to their specification and generally do all the legwork. What could be easier and fairer? He concluded:

Of course it is possible that no submissions will be made. ... After all, why have tests when you can have arguments? But this would be a pity, since it would tend to sabotage the Urania Trust claim that astrology is set to revolutionise the world, which presumably will need more than mere arguments.

Follow-up

The self-test was in effect a follow-up to an earlier exchange with Ronald Harvey, an astrology observer for 35 years. In *Correlation* 4(1), 34-35, 1984 and 4(2), 33-38, 1984, Harvey claimed that the work being presented in *Correlation* had little relevance to astrology because:

[Astrology has] never depended on the sort of objectivity claimed by science ... Astrology cannot be fragmented and analysed bit by bit. ... it is a metaphor ... Astrology provides us with a framework for orientation, for significance, for possibility, for potentiality, but not for fact. ... It is for meaning, for discovery (not only self-discovery). ... The wretched creature anatomized on the lab table [in *Correlation*] is not recognizable. It is certainly not astrology (4(1) p.35).

But how would that differ from merely providing clouds for users to see faces in? Anyone who expected those clouds to contain anything objective would surely be missing the point. In his reply, Dean noted that the supposedly impossible analysis of astrology bit by bit was what all astrology textbooks did all the time, and they showed that many astrological claims were eminently falsifiable – for example, the claim that people with X in their birth charts will be more Xish than people without X – so it made no sense to dismiss such claims as mere metaphor (which in any case tends to be a cover for actual belief):

Furthermore, Harvey's attack on science misses the point. The reason for adopting a scientific approach is that it protects us from the fallibility of human inference and the strong human tendency towards self-deception. ... Unfortunately astrologers have shown no awareness of such factors. Consequently, when their experience conflicts with ugly facts, they rush to invoke way-out explanations such as synchronicity, the horrors of science, and paradigm differences, rather than simple human failings. This is rather like invoking the end of the world to explain why the lights go out during a power cut (4(2) p.34).

Dean then reminded Ronald Harvey that:

phrenologists and bloodletters were just as convinced that their practices worked, and for precisely the same reason – in their experience they could see them work. Yet we now know that they were mistaken. Perhaps Ronald Harvey could explain why we should believe astrologers but not phrenologists and bloodletters (p.34). [He didn't explain]

Four questions

To help researchers improve their research Dean invited readers including Harvey to answer four questions he had previously aimed at the 60 subscribers to *Astrologers Forum*, a monthly publication in Australia for debates on astrological issues. Four had replied. All were highly experienced astrologers – three were practising professionals and one was an examiner. Six more had replied without answering the questions. The questions with brief answers were:

- How do you know astrology works? *By experience.*
- How do you know the claimed correspondences are real and not illusory? *By experience 2. I don't 2.*
- Why should we accept your beliefs about astrology rather than contrary beliefs? *No reason at all.*
- What sort of evidence would prove your beliefs wrong? *Scientific evidence 2. None 1. Not sure 1.*

Harvey did not answer the questions other than to say he was in his 74th year and to him "astrology has shown considerable fertility". Instead he accused Dean of avoiding the main issue (not described but presumably that astrology is not amenable to scientific enquiry):

He [Dean] seems determined to believe that reductionist analysis is the best way, perhaps the only way, of investigating astrology. His mind is made up: don't confuse him, don't broaden the issue. Keep it simple, as simple as possible, so that it can all be done by numbers (4(2) p.36).

As for how research should be done, Harvey cited various names including Bohm, Pribram, and holograms (where each part contains information about the whole) and concluded:

We are dealing with intricate and closely integrated webs of variables. To isolate one factor and treat it on its own is to falsify the investigation. Wholes must be seen and understood as wholes (4(2) p.37).

In short, the debate reduced to:

Experience can fool us so **we need science** –vs– We trust our experience so **we don't need science.**

Comment 1 Back at the *Astrological Journal*, Dean's piece had been written to overcome further futility. But despite it being read by many top astrologers worldwide, there was no response. There was evidently no interest in demonstrating how astrology could actually deliver what astrologers claimed, thus silencing their critics forever. But look at it this way – if you had a fervent belief or were making money from it, would you allow any chance of it to be proven wrong? Of course not. Talk? Maybe. Criticise others? All the time. But tests? Never!

Comment 2 That was in 1989, and it had no effect. Thus eight years later, in *Astrological Journal* 39(6), 77-78, 1997, Harvey again attacked *Correlation*, this time complaining about:

The pretentious language, the insufferable pedantry, even the rigid requirements and conventions regarded as necessary for publication showed me that, as far as presentation went, little had changed; what had changed seemed for the worse. To go on one's knees to such an extent to ingratiate oneself with that majority of scientists who seem unable to extricate themselves from the nineteenth century seems to me abasement of a nature difficult to defend.

To which the then editor of *Correlation* Rudolf Smit replied:

Ronald Harvey appears not to understand the function of *Correlation*, ... [his statements] have no substance whatsoever. ... the whole function of *Correlation* [is] to find out whether the thousands of claims found in astrology text books, or expressed in private sessions by astrologers, have a solid basis in reality. ... it has all to do with keeping one's feet on solid ground (*Astrological Journal* 40(1), 64-65, 1998).

Adding later in *Correlation* 16(2), 2, 1997 that Ronald Harvey:

does argue that theories (such as astrology) are not a matter of being true or false but of being fertile or sterile, but ... he is stretching this too far ... The point is, if a person has a chart saying they are such and such, are they *really* such and such? I can agree with Ronald Harvey that astrology is an *experience*, often a truly wonderful one, but if the chart is conveying information which in fact is all wrong, then it is an experience we can do without. If Ronald Harvey feels that *Correlation's* attempts to separate fact from fog are pretentious, rigid, and insufferable, all he needs to do is submit an article that corrects our ways. If it meets our scholarly standards then I would be pleased to publish it. The same applies to anybody else who thinks *Correlation* is getting it wrong. [There were no submissions]

Comment 3 Ironically the same points had been discussed by Patrick Curry in the very first issue of *Correlation* 1(1), 4-10, 1981:

There seems to be two groups of people for whom astrological research will never make sense. One consists of those for whom any taint or trace of astrology is intolerable, since it is "obviously" false, superstitious and regressive. ... The other group is made up of persons who can tolerate no close examination or questioning of astrology, since it is "obviously" true, self-sufficient and sacrosanct. ... Luckily for the future of the subject, there also exists a number of people who refuse to *assume* – either way – what is under question. As Bertrand Russell remarked, assuming your case "has many advantages. They are the advantages of theft over honest toil" (pp.4-5).

Curry noted that there are two different views of astrology, both deserving research, namely physical (planets directly affect people) and non-physical (as when planets work symbolically or synchronistically). His view that astrology deserves research was immediately challenged by Michael Shallis in *Correlation* 2(1), 42-44, 1982, who claimed that:

Astrology is not a system of knowledge in the way science is. [Instead it] arises from a totally different world-view from that of modern science. Astrology is derived from Principles. Although, in science, principles can be deduced, true Principles are given – they are the fundamental bases from which further things are derived. ... the rational mind can never, therefore, comprehend the origin of Principles. They are not rational in that sense (p.43).

Curry's response said that Shallis was wanting to abandon research altogether in favour of belief in imagined and unspecified Principles, yet research was needed to prevent astrology sinking under the weight of proliferating inconsistencies. To which Shallis replied by again pointing out that the difference in world-views made the one (scientific research) simply irrelevant to the other (astrology). It was the perfect circular argument.

Twelve years later the debate reached a climax in *Correlation* 13(1), 11-52, 1994 when the relevance of the scientific approach to astrology was debated by 25 astrologers (out of 100 invited) and 8 scientists (out of 10 invited), which resulted in a vote of 15:4 in favour of its relevance but only to those parts testable by observation, see 7.7.1994.1. But it had little effect on how believers reacted to any questioning of their belief – they continued to dismiss such questioning because to them their experience was final, conclusive, and unexplainable by what they saw as science (no matter that it was readily explainable by psychology).

Unfortunately the believers' insistence on assuming their case rather than demonstrating it (why have tests when you can have assumptions?) led to the crippling disagreements, albeit not crippling to them, that now undermine every area of astrology as described in Chapter 4.

7.7.1990.1 An argument over harmonics

Wim Van Dam and Albert Bredenhoff, *AinO* 5(1), 39, 1990.

In *AinO* 3(1), 41-46, 1988 (not summarised here), Wim van Dam noted how it was generally supposed that harmonics were the foundation for aspects, where, for example, conjunctions in the *n*th harmonic are supposed to reveal the nature of *n*th aspects in the birth chart. But he felt the idea was invalid. He pointed out that an exact *conjunction* in the birth chart will always be a conjunction in any harmonic. Similarly an exact *opposition* in the birth chart will always be a conjunction in an even harmonic and an opposition in an odd harmonic. This means that conjunctions will have the same quality in the 2nd and 4th harmonics, and also in the 3rd and 6th harmonics, even though the 2nd and 4th are supposed to be quite different symbolically from the 3rd and 6th. So there is a problem.

In his response, Bredenhoff points out that van Dam is not the first to recognise the problem, and suggests that whenever conjunctions occur in both the harmonic and natal charts, the interpretation take only the latter into account. Van Dam answers that this does not solve the problem of an idea that contradicts itself. Also, to ignore a harmonic conjunction in favour of a natal conjunction implies that traditional aspects are stronger than harmonics and therefore cannot be founded on them as is generally supposed. He concludes that the internal contradictions make the whole idea invalid. In other words, aspects cannot be founded in harmonic theory, which of course does not mean that harmonics themselves are without value.

Comment This is a *reductio ad absurdum* argument. It starts with an untested speculation

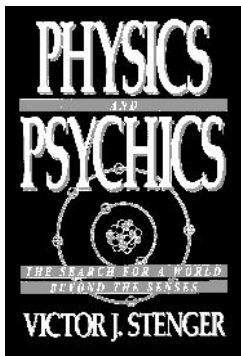
(here aspects and harmonics) and then applies logical analysis. If at some point the result is absurd, the original proposition is false. Arguments can also be open-ended, as in what US researcher Donald Bradley called "the vexed question of house division", where arguments about house division have filled entire books and countless articles, but without convincing evidence that houses actually mean what they are supposed to mean.

7.7.1990.2 Weak or strong holism? A world beyond the senses?

Victor Stenger, *Physics and Psychics: The search for a world beyond the senses* 1990. Points for us to think about.

Most people and all astrologers take as self-evident the division into matter and spirit, a material universe subject to natural laws and a spiritual universe not subject to natural laws. Support for the latter can be found in the literature and customs of all ages and cultures. US physicist and astronomer Professor Victor Stenger (1935-2014) comments:

I have looked with my eyes at pictures taken with a scanning tunneling microscope and have seen atoms, so I believe in atoms and the fundamental discreteness of matter. I have looked at pictures taken with the most powerful telescopes showing distant galaxies, so I believe in galaxies and the immensity of the universe. But nowhere in those pictures do I see the slightest direct or indirect hint of gods, spirits, or ghosts. These only seem to exist in the dreams and fantasies that rattle around in our heads. ... The most basic truths about the universe – its size, constituents, the fundamental laws these constituents obey, and humankind's place in it – are nowhere even hinted at in the sacred scriptures that recorded the supposed revelations of history's leading religious and mystical figures (pp.11-12). If sacred revelations were so wrong about this world, how can people still believe that they tell us anything about other worlds, worlds beyond the senses, and ultimate reality? (p.22).



Clearly the answer is "very easily"! He adds:

I can just imagine critics pointing to me as another of those closed-minded scientists who always think they have all the answers. Let me try to make it as clear as I possibly can. We do not have all the answers. Rather, we currently have no questions – at least no questions about the fundamental nature of matter forced upon us by observations of the real world that threaten the Standard Model [which successfully describes all that is empirically known about elementary particles; nonmaterial components to the universe are not justified by the data]. ... This situation is not likely to continue. [New discoveries] will undoubtedly result in the rejection of the current Standard Model. Possibly they will even lead us to revoke the material, reductionist, and quantum mechanistic view of the world that now works so well. But if this happens, it will be because empirical evidence demands it, not simply because of pious philosophising or wishful fantasies based on the superstitious beliefs of the prescientific age (pp.26-27).

In other words he is claiming no more than the astrologers in 4.2.1 are claiming, namely that his/their views are based on observations, not fantasies. On holistic views in general (which of course include astrology's *as above so below*), he comments that they:

come down to the view that the universe is an unbroken wholeness that can only be fully understood by a consideration of the whole. Reductionism holds that the universe consists of parts that interact with one another only locally – meaning nonsimultaneously. The holist says that this is an approximation that works sometimes, but not all the time, and especially not if we attempt to understand the essence of the universe, which can only be done holistically. ... How do we distinguish between these two possibilities? The usual way: empirical test. An important clarification must be made at this point. We have to distinguish between two forms of holistic conceptions, which I have labeled "strong" and "weak". The weak form merely says we can find principles that describe the gross behavior of complex systems, principles that bear little or no resemblance to the reductionist laws obeyed by the parts of the system. [Think of a clock] ... Weak holism is a rather obvious and non-controversial concept. Strong holism, on the other hand, with its claims of miraculous power, raises issues of a far more fundamental nature (p.273).

In the strong form of holism, such great force flows from the whole to the parts that miracles happen. ... New Age holistic thinking is that quantum mechanics provides a scientific basis for departing from the atomic [ie reductionist] view of nature. Quite the contrary. ... The core principle of quantum mechanics is that the universe is made of discrete parts. To somehow turn this around and say that quantum mechanics supports the notion of a continuous whole is an incredible feat of misrepresentation. ... How can we test strong holism? The same way we test any paranormal or supernatural claim: look for a miracle; find a convincing demonstration of the breakdown of reductionist science. ... No experiment done with human subjects has ever provided conclusive evidence for any phenomenon violating the hypotheses of reductionist, materialist science, despite countless claims and testimonials. [They] provide us with insufficient reason to consider the additional hypothesis of strong holism (pp.274-275).

In short, unless you have *conclusive evidence* there is *insufficient reason* to believe. So unless your beliefs are sufficiently evidence-based, you should keep them to yourself:

Again, you can argue that this does not "prove" the nonexistence of a spiritual component; I will again simply counter with Occam's razor: nothing in the data forces us to introduce the additional hypothesis of such a component in human thinking (p.126). **Comment** Nevertheless millions derive comfort and support from beliefs lacking material evidence – think of religious beliefs even though they have led to war (at least astrology has never been that bad).

7.7.1990.3 How to do research

J Lee Lehman, *NCGR Journal*, Spring 1990 pp.9-26, with six tables, ten figures, and thirteen references. In a preface (pp.7-8) the author notes that most NCGR members do not do research, nevertheless it is important they understand the how and why of research, which answers questions like "why is this person different from that one, what distinguishes alcoholics astrologically, are separating aspects really different from approaching ones?".

In research, a testable hypothesis is put forward, a test is designed, data are collected, and a conclusion is drawn. Whatever you may think of scientific methods, there are many issues in astrology that they could resolve or at least clarify. But you must proceed logically:

One of the biggest mistakes that people make in beginning a research project is to study a condition (say musical talent), collect as much data as possible, and then wonder what to do with it! The most important thing that you ... need to do at the beginning is to decide what the model ... and ... the nature of the study is going to be (p.10).

The author then covers astronomical artifacts, control groups, sampling, data collecting, data analysis, and statistical testing. Early on it is important to be sure that your model does not predict more outcome conditions (say musical talent) than exist in reality, otherwise it

will produce ... "false positives" (ie people who match the model but don't have the condition), and thus, one can conclude without even needing to gather a sample that this model is completely wrong (p.20).

She stresses that statistics is essentially a method of evaluating the difference between what the model predicts and the actual results. It is not the only way to study astrological problems, but if done well it can provide a great deal of interesting information. **Comment** As shown by the results in this book. While the absence of consistently positive results is disappointing, they nevertheless provide a great deal of information relevant to understanding astrology.

7.7.1990.4 Science, astrology, and language

Jacob Ruijling, *AinO* 5(1), 3-12, 1990.

There are two main groups in astrology, namely researchers and practitioners. They are hard to unite because they use language differently. A good example is the recent 1986 book *Wat is toch astrologie: mogelijkheden en beperkingen van een oude kunst* [What is astrology actually: possibilities and limitations of an ancient art] by the famous Dutch Jungian astrologer Karen Hamaker-Zondag. The text claims to provide information on modern astrology. But it is never clear whether astrology can or cannot predict, whether it is deterministic, whether it works, and if it works how it can be explained. How can astrology provide information when it is so unclear? According to Ruijling, the lack of clarity arises because the single word *astrology* is used for two different things, namely *information* and *meaning*. Researchers would never confuse the two whereas practitioners like Hamaker-Zondag do it all the time. Conclusion: astrologers should (1) recognise the difference, (2) use clear language, and (3) justify their claims in view of the lack of empirical support. **Comment** Nearly 30 years later the situation is unchanged. Astrologers still muddle the difference between information and meaning.

7.7.1990.5 Why researchers need to consider effect sizes

Geoffrey Dean, *AinO* 5(2), 2-6, 1990.

To what extent are astrological claims true? That is, how big are astrological effects? Research results are usually described in terms of statistical significance, but this is not the same as practical significance. What we need is an effect size, commonly expressed as a correlation coefficient or a similar measure such as kappa (corrected if needed), which gives the size of the effect on a scale of 0–1. Unlike significance levels, effect sizes tell us how big the effect is and how useful it is in practice. They also allow immediate comparison with other effect sizes.

Comment Effect sizes effectively equal to 0.00 are just as interesting as effect sizes not equal to 0.00. The most relevant results are in Chapter 8.

7.7.1990.6 What research should astrologers be doing?



Excerpts from "An Interview with Andrew Patterson", *Astrology Today* [Johannesburg], first quarter 1990, pp.24-28, in which he stresses the need to check astrological statements to make sure they are actually true. For more on Dr Patterson's views and background see 7.2.1991.1.

How long have you been studying astrology?

Since the end of 1975. It attracted me because I have always been interested in human motivations and classification of personality, and astrology seemed to me to have something to say about both these things. Even as an engineering undergraduate I spent far too much time reading psychology, simply because it was so fascinating.

What are you now referring to?

I have come to a crisis point with astrology. Recently I read an article in which a psychiatrist was quoted as saying that astrology, like religion, is nothing but a delusion system. I am not at all sure he is wrong. Are we just kidding ourselves? What I am questioning is whether the statements we make when looking at a chart are in fact true. ... because almost every chart reading I've ever seen overwhelms me with the sheer torrent of words, phrases, sentences and paragraphs, pouring at you, tumbling over themselves in an avalanche – all of which has me shouting "Stop! Stop!". What I want to do is slow everything down to the point where we can examine carefully the statement made.

Are you saying we should apply the statistical methods used by psychologists?

I don't think we have to be that sophisticated, at least not to start with. Sheer common sense will take us a long way. For one thing, we *must* identify and clear away any statement that applies to everyone [or is] merely what they want to hear. So how do we treat what is left? And what is left? To my mind it is statements about how people experience everything: their lives, the people in it, and themselves. If we say, for instance, that a woman with Moon square Pluto feels worthless, constantly demands security reassurance, and feels threatened by her mother, let us check with a dozen suitable subjects that they do indeed experience this, *and* that people without that aspect do *not* experience all of those things. That proviso is terribly important, because without it the statement is unfalsifiable.

Are you aware of others who, like yourself, believe that much of astrology may not be true?

Yes I am. Dr Geoffrey Dean ... is an ex-astrologer who has scientific training, so he is in a position to design and carry out very well constructed experiments to check the sort of thing I have been talking about. He summarized much of the relevant work in "Does astrology need to be true" in *Skeptical Inquirer* 11(2), 166-184 and 11(3), 257-273. 1986-1987 [for an update see 8.6]. Some of it is scary ... [astrologers] are unable to do better than chance.

What attitude are you taking about all this?

I'm trying to keep an open mind ... But I have also prepared myself for the possibility that *all* of astrology may some day be shown to be nonsense. If that day comes, it will at least have told us something about human nature. I hope that it does not, because my present feeling is that astrology is a great truth, but we are going to have to be very much better disciplined about it to get to the nugget of gold that lies at the heart of a million tonnes of verbal dross.

One of my worries of modern astrology is that it seems to contain too many technicalities. When you bring in mid-points, minor aspects, planetoids, the centre of the cosmos, and all the other apparatus, including monstrosities like the hypothetical planets, I reel back in dismay. And that is because the more details you bring into the picture the more it is possible to explain anything with anything.

Comment In a letter in the same issue he addresses the same problem:

What is the sense of an astrology that can do no more than endlessly confirm symbolism? What is the use of astrology if all it can offer is *ex post facto* explanations? Hindsight gives us perfect vision: What we need is a body of knowledge that can indicate more than mere potentials, otherwise, I submit, it is almost worthless (p.8).

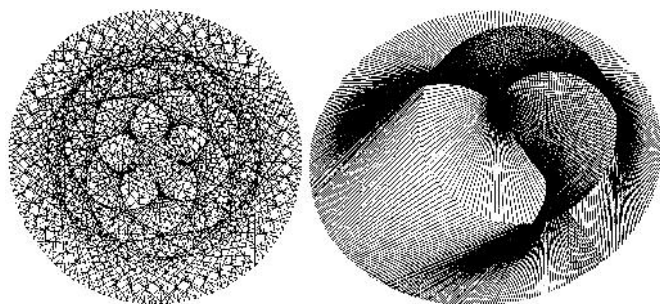
The needed body of knowledge he was referring to is of course what the studies in this book were trying to establish. Whatever our views of the outcome, hopefully we might agree that at least the results have told us something about human nature.

This point was explored by sociologist Nick Allum in a survey of 1000 people in each of the 25 EU member states made in 2004 about their belief in astrology ("What makes some people think astrology is scientific?", *Science Communication* 1-26 December 2010). He found that people who think astrology is scientific tend to be uninformed about science, confused about what astrology is, and intolerant of uncertainty (they had to believe something). There was much more belief in serious astrology, which was seen as a sort of vague divination, than in newspaper horoscopes. His survey also showed that polls asking about belief would be better asking about behaviour (have you read books on astrology, visited an astrologer?).

7.7.1991.1 Imagination, reality, and planetary mandalas

Nick Kollerstron, *Kosmos* 20(3), 4-12, 1991, and Mark Pottenger, *Kosmos* 20(3), 13-17, 1991.

There are many planetary mysteries that challenge science such as why Venus rotates backwards in the opposite direction to that expected if the inner planets had all condensed from a vortex around the sun. Astronomers can theorise about these mysteries, but to me (Nick K) astrologers can see what is really involved, namely the signature of the Planetary Being as conceived by Paracelsus. By using our imagination we can see what really exists and its real meaning. Such things can be enjoyed via planetary mandalas. The computer technique most used by me (Mark P) draws straight lines between a pair of planets on a series of evenly spaced dates, essentially connecting the dots where dots = planets. Some mandalas are

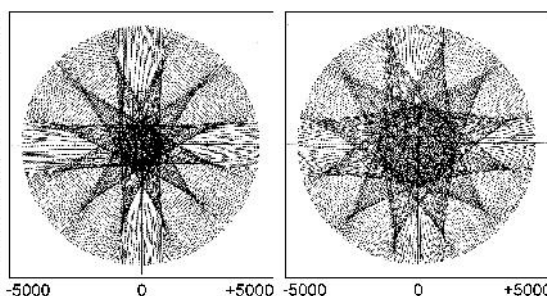
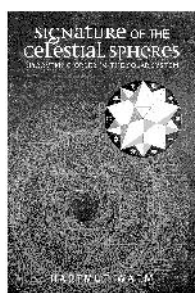


simple, others are complex enough to allow viewers to interpret them like the famous Rorschach inkblots. What do you see in these shapes? The possibilities are countless.

Connecting the planetary dots. **Left:** Weekly heliocentric Venus to Earth during January 1985 to January 1993. **Right:** Weekly heliocentric Mars to the asteroid Pallas during February 1955 to December 1959. From Pottenger 1991 pages 13, 17.

Comment

In his 2010 book *Signature of the Celestial Spheres: Discovering order in the solar system*, German civil engineer and independent astrogeometry researcher Harmut Warm connects the dots with what he calls a *linkline*, an imaginary line linking two bodies A and B as seen at a specific time from body C, where C can be A or B or neither. Linklines can be drawn at consecutive intervals that are either arbitrary or related to orbital geometry.

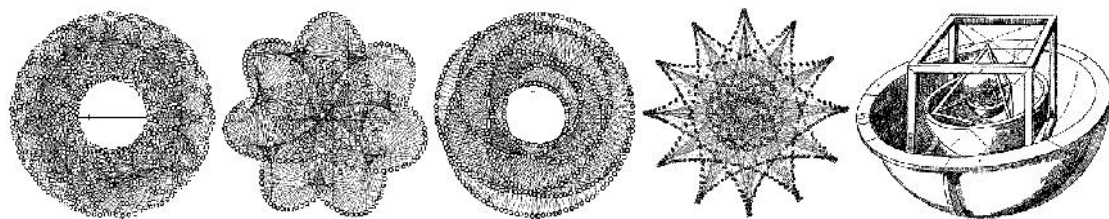


Left: Linklines at Jupiter-Saturn conjunctions, N=750 for 14894 years from 5 April 4950 BC.

Right: Linklines between Jupiter and Neptune (left) and Saturn and Neptune (right). The numbers are the scale in millions of kilometres. From Warm 2010:243.

Here the almost unlimited choice of ABC x intervals, the many natural resonances

within the solar system, and the power of modern computers, all combine to generate almost unlimited images of almost unlimited variety, some of them of astonishing beauty. Warm's book is wordy, densely technical, and contains nearly 200 such images, some in colour.



From left: View of Mars from Venus at Venus-Earth conjunctions, N=800 over 1279 years from 30 March 2001. View of Mars from Venus at Venus-Neptune conjunctions, N=300 over 195 years from 17 March 2000. View of Venus from Mercury at Venus-Jupiter conjunctions, N=700 over 454 years from 22 May 2000. View of linklines between Jupiter (inner dots) and Neptune (outer dots) from Saturn at Jupiter-Neptune conjunctions, N=750 over 9586 years from 16 April 2605 BC. Finally Platonic solids (harmony of the spheres) from Kepler's *Secret of the Universe* 1597. From Warm 2010:137, 213, 194, 269, 45.

Warm sees his results as not only confirming natural resonances within the solar system (whose existence no astronomer would disagree with), but also as support for mystical ideas such as Kepler's harmony of the spheres and ultimately man's connection with the universe. Curiously he never mentions the word "astrology", nor the word "numerology", which his approach ultimately reduces to. He concludes:

In the final analysis it is a matter of belief to infer that a more or less incomprehensible existence and what looks like a highly improbably ordering of things points to the work of a creative force. So of course the order in our planetary system, too, does not prove that God or anything similar exists. All that it reveals in its various aspects is that the arrangement of the celestial bodies is built up in a way that looks like the work of a conscious, creative force. ... As the example of Kepler's stellar solids shows, such creations are anyway often more akin to discoveries of existing realities already present in some mysterious realm of being (p.295)

Which view he reinforces in his preface:

And my wish for readers of this book is that they may experience profound joy and spiritual benefit as their familiarity with the celestial harmonies grows [and] a full flow of that inner certainty, that meaningful order, with which the Creation has been endowed from the beginning (p.6).

7.7.1991.2 Review of three large-scale tests

Wout Heukelom, *AinO* 6(1), 29-39, 1991.

The author reviews three large-scale tests of astrologers by Carlson (*Nature* 1985), Dean (*Correlation* 1985, 1986), and McGrew & McFall (*Journal of Scientific Exploration* 1990). He plays the role of a devil's advocate who criticises both astrologers and scientists. Main conclusions: **(1)** Astrologers think they can judge the quality of well designed scientific studies, and carry out difficult matching tests. Apparently they cannot, but neither can any untrained person. **(2)** In these three studies not a single astrological rule, either alone or in combination, was found to be valid. For which there is no satisfactory explanation from the point of view of astrology. **(3)** Readings by astrologers of the whole chart were also found to be invalid. Another point against astrologers. **(4)** Astrologers disagree in their assessments of a single birth chart, and in their confidence in that assessment, and more than one third disagree with themselves when assessing the same natal chart for the second time. **(5)** Astrologers assume their success is due to the validity of astrology. They are wrong, because clients appear just as happy with delineations from wrong charts. **(6)** Probably astrologers are not aware of the psychological and physiological mechanisms (like Barnum effects and body language) that could explain their apparent success. **(7)** Astrologers protect themselves against the negative results of the scientific studies in which they took part by adopting astrological and non-scientific explanations. **Comment** Brief but very much to the point.

7.7.1991.3 Book review: *Astrology weighed*

Albert Bredenhoff, *AinO* 6(2), 49-50, 1991. A review of Jan van Rooij's *Astrologie op de weegschaal* 1991.

This short book is about the psychological foundations of astrology. The author is a personality psychologist at the University of Leiden who has made many tests of astrology. He observes that astrology is applied to almost every aspect of human life. For example to metals (Sun = gold), colours (Sun = yellow), the human body (Sun = heart), and events (Sun = election of presidents or sinking of the *Titanic*). Each of these items (gold, yellow, heart, presidents) has a clear and unambiguous meaning. But when astrology is applied to personality it is suddenly different, because the meaning depends on whether personality is defined as behaviouristic, cognitive, humanistic, psychodynamic, or trait. However, psychodynamic (behaviour reflects internal drives that often conflict) and trait (overlapping traits explain individual differences) are closest to astrological ideas.

If astrologers want to apply astrology to personality, they need to **(1)** formulate their own astrological theory, or **(2)** take existing personality theories and translate them into astrological ones. But they either mix everything up or do neither. For example we expect astrologers to attribute a unique set of traits to each sign, but there is much overlap and inconsistency. To

planets astrologers attribute concepts such as instinct, need, motive or drive, but again there are many inconsistencies. For example Tad Mann sees the Moon as *instinctual responses*, but Stephen Arroyo sees the Moon as *conditioned reactions*, which meanings are almost directly opposite. Similarly some astrologers see personality reflected in the whole chart, others see it in the Ascendant, and still others see it in the MC.

So astrologers face questions such as: Is behaviour the result of traits or motives, or both? How are traits and motives related to each other? This question is apt, for astrologers do not work with signs or planets, but with planets-in-signs, often with the same traits as the signs itself! Thus one may read that Sun-in-Aries makes a person impulsive, as does Mars-in-Aries, as does Sun in Aquarius. So, exactly how do the psychological meaning of signs and planets differ? To make things even more complex, astrologers also describe planets-in-houses in terms of traits. In other words existing astrological definitions are sloppy, their foundations are unclear, and the applied psychological terms are a mix of everything. Definitions of planets, signs and houses are almost interchangeable.

With such loosely formulated concepts it is perhaps no surprise that empirical studies into astrology do not validate astrological hypotheses based on those loose concepts. So what is the answer? Here van Rooij advises astrologers to first develop a sound astrological theory of personality that leads to clear hypotheses that can be tested. Furthermore, when astrologers refer to psychological theories (as they do from time to time) they might as well look at the empirical results in psychology. For example for some years there has been a consensus that there are five basic clusters of personality traits called the Big Five. Astrologers might wonder why psychologists did not find a Big Twelve instead of a Big Five, since five into twelve won't go. Or could these five basic clusters [extraversion, neuroticism, conscientiousness, agreeableness, and openness to experience (intellect)] be connected with the five traditional planets Mercury, Venus, Mars, Saturn and Jupiter? **Comment:** No connections between the Moon element and the Big Five could be found when tested, see 2.3. **End of comment.**

In short, van Rooij states that astrological personality "theory" is a mixture of conflicting views on personality, and that astrology fails as an actual theory of personality. So its principles must be clarified and made consistent to allow testing. This contradicts astrologers who claim their outcomes are always based on experience, because knowledge based on experience is not infallible. So astrology will advance only if astrologers can specify its principles in testable ways (van Rooij gives no specific examples of how it might be done). It is astonishing that these problems have been tackled only now, and not by an astrologer but by a psychologist.

7.7.1992.1 Editorial: Astrology in *AinO* vs other journals

Wout Heukelom, *AinO* 7(1), 1, 1992.

Compares *AinO* with astrological publications in other countries. Astrology in other countries tends to be dominated by a few large organisations, whereas here in the Netherlands we have many small organisations that divide our already small population (only 15 million in 1992). But *AinO* is not simply a Dutch version of, say, *Correlation* in the UK or *Astro-Psychological Problems* in France. It is a completely independent and impartial journal that encourages well-considered opinions on astrology. The basic assumption is that astrology can be best researched via two critical approaches, namely that of the well-informed scientist and that of the well-informed astrologer. Due to this dual approach, *AinO* contains critical articles written by both critical scientists and critical astrologers. **Comment** It set *the* standard in this field.

7.7.1992.2 We are not good observers

WP Trower, *AinO* 7(2), inside front cover, 1992. Reprinted from *Newsweek* 4 August 1992.

The author is an experimental physicist at Virginia Tech USA. Here is an excerpt: Human beings are not good observers. Any trial lawyer will tell you that the most unreliable witness is

an eyewitness. That's unfortunate, but the real trouble is that we are very clever. When facts are missing, or don't make sense, or are forgotten, we manufacture them to suit our favourite (often subconscious) scenario. Scientists take great care to avoid this human failing of self-delusion. Only by seeing the world as it is can we have any chance of discovering what it is made of and how it works. ... We must relentlessly question everything, assume as little as possible, and trust no one, especially ourselves. **Comment** If we see meaning as more important than facts, ignoring facts can sooner or later make fools of us.

7.7.1993.1 Astrology needs a factual basis

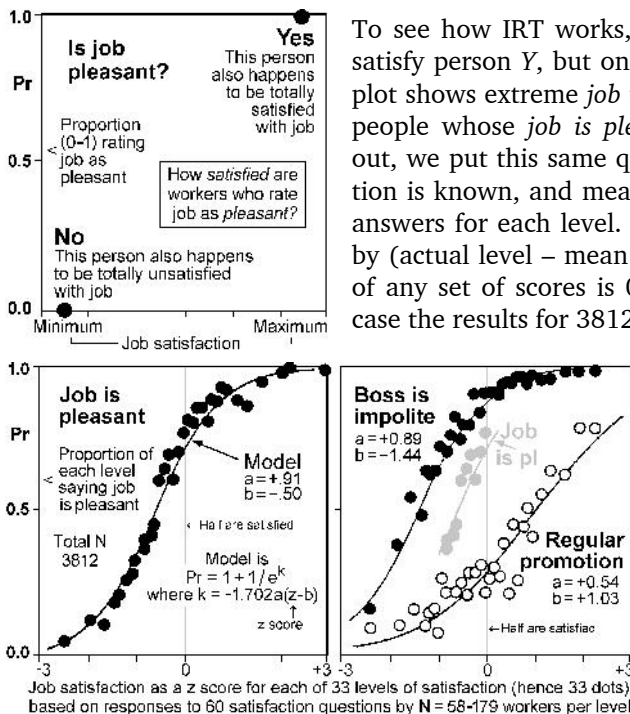
Jacob Ruijling, *AinO* 8(2), 20-27, 1993.

Concludes that in astrology anything about everyone and everything can be said without any factual basis for it. The author calls on astrologers to recognise this sad situation and do something about it. **Comment** Like other such calls, this one had no discernible effect. But the present book is, among other things, a look at what astrologers could do, see Chapter 10.

7.7.1993.2 Can a probabilistic approach (IRT) help?

Geoffrey Dean, *Correlation* 12(1), 10-27, 1993. A chart that inclines and never compels is necessarily an exercise in probability. So this article explores a probabilistic approach to interpretation. The original includes BASIC routines.

In psychology the probabilistic approach has become synonymous with *Item Response Theory*, which since the 1980s has been widely applied in education and psychology testing in Europe and the USA. Unlike the standard approach, which ignores differences between questionnaire items and simply adds up the hits, IRT takes the differences into account. Getting the best fit involves calibration with many subjects, and repetitive calculations that require a computer. Otherwise IRT is no more difficult than the standard approach. IRT can be applied to any trait, attitude or ability that requires estimation via data, and in principle is ideally suited to chart interpretation where many different factors have to be combined for a proper synthesis.

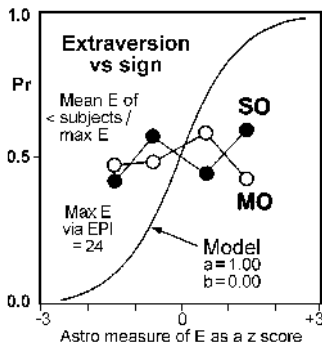


To see how IRT works, suppose we want to know if job X will satisfy person Y, but only have answers to *is job X pleasant?* The plot shows extreme *job is pleasant* answers. But how satisfied are people whose *job is pleasant* answers are in between? To find out, we put this same question to people whose level of satisfaction is known, and measure the proportion of *Yes job is pleasant* answers for each level. We convert the results to *z* scores, given by (actual level – mean level) / standard deviation, so the mean of any set of scores is 0 with a standard deviation of 1. In this case the results for 3812 workers are shown next:

Left: If the measure is valid, all IRT results fit an S-shaped curve between the two extremes. In the fitted equation *a* is steepness, *b* is left-right position, -1.702 converts to a normal distribution. Result shows about 70% of people halfway on job satisfaction (*z* = 0) will answer Yes, *job is pleasant*. **Right:** Curves for *boss is impolite* or *regular promotion* are respectively moved up or down. All three items measure job satisfaction but the halfway points are not the same. IRT uses maximum likelihood estimation to pick the answer that best fits the observed measures, but at the expense of requiring much data for its calibration. From PC Smith et al, *Measurement of Satisfaction in Work and Retirement* 1969.

We can now see the relevance of IRT to astrology. From many birth charts we derive S-curves for every possible chart signicator relevant to, say, extraversion. For the signicators present in a given chart we apply IRT to get the extraversion score that best fits those signicators. In

effect IRT provides a synthesis based on observation rather than guesswork. For example, take the EPI extraversion scores of the 120 personality extremes analysed in 7.6.1985.2, and their chart indications based on Sun and Moon signs. If sign is positive then score 1, else score 0:



Unfortunately the IRT results are negative. The sign signifiers show a good range of values (horizontal axis) but no tendency to show an S-curve as would be expected if they were validly related to the subjects' EPI extraversion scores. Instead they produce near-flat curves as would be expected for random data, which confirms the importance of having valid signifiers.

In this case our chosen signifiers do not relate to extraversion scores so neither will IRT. Nevertheless IRT remains arguably the best available tool because it can cope with complexities well beyond the ability of any astrologer. The problem is that chart signifiers usefully related to reality have yet to be identified and (judged by the research to date) may never be identified.

7.7.1994.1 Is the scientific approach relevant to astrology?

Geoffrey Dean, Arthur Mather, and 33 others *Correlation* 13(1), 11-52, 1994.

In 1994 attitudes towards the scientific approach were surveyed. Each of 25 astrologers (out of 100 invited) and 8 scientists (out of 10 invited) received an 8-page discourse *Is the scientific approach relevant to astrology?* and sent in comments. The discourse was amended and re-circulated for more comments, a process that took the editors about 150 man-hours of work. Comments filled over 30 pages of A4 and ranged from a few sentences to 4500 words.

Of the 33 commentators, 12 made no specific response. The rest voted 15:4 in favour of yes, the scientific approach is relevant to astrology, but only to those parts testable by observation (which of course is akin to a circular argument). Interestingly there was more disagreement among astrologers than between astrologers and scientists. Dissenters argued that science is mechanistic and therefore incompatible with a non-mechanistic astrology. Assenters argued that testing whether a person fits their chart better than a control requires no mechanistic assumptions whatever (pp.45-46). As for distrust and abuse of science:

For example *scientism* or deviant science. Thus scientism might imply the view that present scientific techniques cannot be improved, or that all possible tests of astrology will fail, or that there is no basis [ie known mechanism] for astrology, or that science is the only way of knowing. Such views have no place in genuine science. Its counterpart is *astrologism*, which might imply the view that nothing else is relevant because astrology is the way, the truth and the light, or that it is meaningful to describe isolated factors but meaningless to test them, or that newspaper horoscopes are valid but a five-minute error in birth time can make all the difference, or that, given the right technique, astrology can explain everything (p.17).

7.7.1994.2 True and false researchers in astrology

Françoise Gauquelin, from an article on research design prepared for *Astro-Psychological Problems* but unpublished due to her ill health. This condensed excerpt focuses on getting the approach right and the need for replication.

By research I mean *scientific* research of the *statistical* type, where we count the occurrence of a particular astrological factor in charts collected for the purpose. The use of statistical tests is fundamental to modern psychology, sociology and much of medicine. But they are dismissed by astrologers who fail to distinguish between the needs of the practitioner (helping clients) and the researcher (validating ideas).

I often receive articles for *Astro-Psychological Problems* that reveal the writer's ignorance of statistical methods. I call them false researchers because they want to make their name in astrology rather than find true results. They buy a computer in order to seek miracles and become a celebrity. Data accuracy does not matter, only positive results – a view that is also shared by magazine publishers. If the result is wrongly declared significant it does astrological tradition more harm than good.

Indeed, if we believe all the innovations published in today's astrological literature, it will send us crazy. Lasting valid results will not come from astrologers ignorant of the rules of statistical research. Pioneers such as Choisnard, Lasson, von Klöckler, and Krafft produced work that was fruitful but their methods were imperfect. Today they are a model of what to do if you wish to make mistakes, as when a fake researcher uses insufficiently large samples or picks particular results without caring if they replicate. A true researcher does not do this. They are also careful to acknowledge the work of others and to read what they actually wrote [which is what the present book provides], because this will make sure that work already done is not overlooked.

If your chosen field is unexplored you should be careful about your certainty of getting valid results, because the laws of probability never lead directly to certainty. At first you will never get a clear answer one way or the other. Such an answer, positive or negative, will be reached only after several patient repetitions of the same experiment. Even if your work is helped by a powerful computer and sophisticated software, it does not mean you will draw a stronger and more valid conclusion, because this comes only with successful repetition. Only if your results repeat will they lead us somewhere useful.

Comment As a sound researcher Françoise tends to be impatient with all the pseudo ones she encounters, which (as this book shows) range upwards from the utterly incompetent. She mentions the need for controls but not the need to have your work checked by experts. This is called peer review and it is always required in scientific journals. But calling it peer review will be meaningless in astrological research if, as often happens, the supposed experts are scientifically ignorant. For an example see 7.7.2004.1.

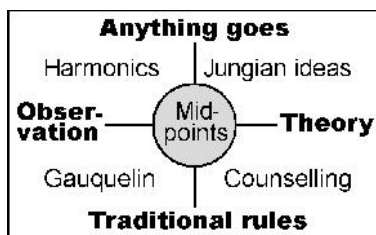
The strategy most likely to be effective in improving standards is to describe in simple terms how prospective researchers need to proceed, as in 7.7.2014.2, with of course many examples of good and bad to learn from (as in the present book).

7.7.1994.3 Better ways of doing research

Charles Harvey, *Correlation* 13(2), 55-59, 1994.

In 1994 Charles Harvey pointed out that the 20th century had seen at least eight major breakthroughs in astrological thinking, namely midpoints, cycles, harmonics, Jungian ideas, mythology, Astro*Carto*Graphy, composite charts, and Platonic ideas:

So we have to ask ourselves why there is such a huge discrepancy between the vitality of astrology as taught and practised and the relatively blocked state of scientific studies. At least part of this paradox can, I believe, be explained by the nature of astrology and the kinds of thinking used by astrologers compared to the kinds of thinking used by most contemporary scientists exploring the area (p.55).



Harvey illustrated the difference in thinking with a quadrant diagram similar to this one:

Four approaches to astrological thinking based on Harvey's original diagram (which was based on the four elements and Jung's four functions), with an example of each combination.

He pointed out that only the lower left quadrant (example: Gauquelin) is generally explored in research whereas the major breakthroughs in astrological thinking have occurred in the other quadrants. Therefore he suggested that if researchers could get away from the statistical approach of the Gauquelin quadrant and explore the symbolic-intuitive approach of the other quadrants, it would "have a much greater chance of providing clear evidence of astrology's power to reveal important information about an individual's psychology" (p.59). He dismissed as "not helpful" (p.58) the idea that these symbolic-intuitive areas are unproven or illusory.

Comment But it is precisely these unproven areas that allow the most opportunities for wild speculation, so their "vitality" should not surprise us. In effect Harvey is accepting untested astrological theories as if they were valid, which is much the same as denying that astrology

could be invalid. Nevertheless many previously untested ideas such as harmonics have now been explored under controlled conditions, see 7.7.1997.2, and in each case the results have failed to provide effect sizes commensurate with the associated claims.

7.7.1994.4 Simple guidelines for research

Jacob Ruijling, *AinO* 9(1), 25-26, 1994. The important ones are:

Keep your research simple, use large samples, seek advice as needed, and know what you are doing. Above all, be familiar with existing good-quality research. **Comment** The present book should help. For starters try the non-tech list in 1.2.1, then 1983.5, 2014.2, and 2016.3 in 7.7.

7.7.1994.5 Difference between astrology and natural sciences

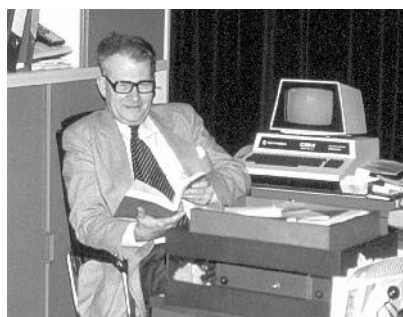
Willem de Graaf, *AinO* 9(1), 32-33, 1994. The author, emeritus professor of astronomy at the University of Utrecht, was speaking at a symposium held to commemorate the 250th anniversary of the world's oldest functioning planetarium in Franeker 100 km north of Amsterdam.

The important difference is that astronomy is about science whereas astrology is about people. The evidence for astrology is mainly negative. But if one seeks counsel to alleviate personal problems there is nothing against seeking such counsel from an astrologer, because astrology is a belief system. However, the client should view this counsel with the highest caution.

7.7.1994.6 Jack Chandu 1925-1994

Rudolf Smit, *AinO* 9(1), 49, 1994.

Jack Chandu, a leading Dutch astrologer and one of the very few astrologers prepared to test astrology scientifically, died 11 May 1994 at the age of nearly 69. He was born in Djakarta 8



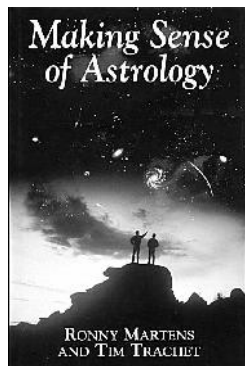
June 1925. Well travelled throughout the world, he made a point of collecting information on time changes. I learned much from Jack Chandu. His textbooks were always outstandingly clear. He did not accept what other astrologers said and always researched claims for himself. As a result he abandoned houses because there were too many house systems, they could not all be correct, and because most of them collapsed in polar regions.

Jack Chandu in his office, December 1981.
The computer is a Commodore CBM.

His critical approach was not always welcomed by Dutch astrologers, who were perhaps envious of his marketing skills. He could also do unusual things like riding a bicycle blindfolded. Sometimes he made spectacular predictions, for example he once predicted the death of a member of northern royalty four months before it happened. He also predicted the death of President JF Kennedy. But he played down such things. He preferred to trust his own research (7.7.1980.2) rather than traditional ideas, which distanced him from other astrologers.

7.7.1994.7 Book Review: *Astrology Sense or Nonsense?*

Rudolf Smit, *AinO* 9(2), 2-18, 1994. Picture is of the English translation 1998.



A long and detailed review of Martens and Trachet's *Astrologie, zin of onzin?* [Astrology, Sense or Nonsense?] 1994. Written by two Belgian skeptics, one of whom had long ago been a practising astrologer, this is a highly critical evaluation focussing more on the technical problems (the "nonsense") than on the benefits (the "sense"). The text covers signs, planets, houses, aspects, psychology, tests of astrologers, and cosmic influences, plus issues such as house division in polar regions, the Mars effect, and lunar effects. In essence this is a good book that achieves its stated aim "to provide information which should enable the reader to judge whether astrology is valid". The information is up-to-

date and reasonably thorough, thus tests of astrologers "are overshadowed by the investigation of Geoffrey Dean [see 7.6.1985.2] which is unequalled in its range, carefulness, thoroughness, and extensiveness". But the review of Gauquelin's findings is biased towards negative skeptic views "the way in which he collected his data is too subjective to prove the reality of a planetary effect" [a view corrected here in 6.6]. It criticises chart interpretations but never explains how they are made, and its description and diagram of the Placidus house system is wrong. The book may be acceptable for specialists but is too difficult and too negative for a wide audience. A missed opportunity.

Comment In the English translation the authors note that Dutch reactions were "not thankful for this book" (p.8), and say they have adjusted their text accordingly. It includes a correct diagram of the Placidus House System but does not mention it was by NVWOA's Bert Terpstra.

7.7.1995.1 Conflict between research and intuition

Bert Terpstra, *AinO* 10(1), 9-13, 1995.

Compares the approaches of science and astrology. In a recent dialogue between Dutch skeptics and Dutch astrologers, the astrologers claimed that intuition is required for correct chart interpretation, yet this condition is violated by most research. Changing the research to suit is extremely difficult because the freedom demanded by intuition conflicts with the controlled conditions needed for research. In other words, say the astrologers, research is practically impossible. In which case, say the skeptics, how can astrologers ever know that astrology works? Author's conclusion: scientific criticism finds only slippery targets in the position of Dutch astrologers. **Comment** For more on intuition see 8.9.2 ff.

7.7.1995.2 Some philosophical problems of astrology

Geoffrey Dean, Peter Loftson, and 13 others, *Correlation* 14(2), 32-44, 1995.

Modern philosophers generally accept astrology as a source of support, but they reject it as a source of knowledge. This matches the idea that astrology can be viewed in two ways, one in terms of its *meaningfulness*, and the other in terms of its *factual truth*. The first is generally unproblematic because it rests on subjective judgements that can legitimately differ. If persons A and B see chart factor X as meaningful, that is the end of it. They do not even have to agree on what X means. But the second faces numerous problems because: (1) Astrology is defined as precisely not the result of any means we know of. (2) Astrological effects cannot be identified except after the event and therefore cannot be a source of knowledge. (3) Astrologers do not agree on what their model predicts, the criteria by which it could be tested, and the evidence they would accept as showing it had failed. (4) No claims to factual truth are justified unless astrologers make proper experiments *and* distinguish between alternative explanations *and* have independent reasons for thinking such truth is possible. **Comment** Meaning vs truth is *the* issue in *all* arguments about astrology. For more see 9.11 and Chapter 10.

7.7.1995.3 Geocentric planetary nodes are effective

Theodor Landscheidt, *Kosmos* 24(2), 20-29, 1995 (this issue of *Kosmos* does not have numbered pages)

Nodes should be a motive for astonishment because, in contrast to planets, they are void of space-filling substance. They are merely intersection points between a planet's orbit and the ecliptic. Nevertheless the astrologer does not question their use. Their interpretation, derived by analogy with "intersection", is "meetings, relations, conferences, social contacts". I have been testing nodes since the early 1960s and am convinced of their reliability. They often completely change the outcome. Thus when WW2 began on 1 September 1939, Venus was conjunct the Sun, and Jupiter was nearly conjunct the Moon, hardly a proper indication of what happened. Only nodes give appropriate indications – the Moon's node is square Pluto, Mars's ascending node is square the Moon, and Uranus's descending node is square the Sun.

Comment The node positions are as seen from the Earth. Unlike the Moon's nodes, and

planetary nodes as seen from the Sun, the north and south planetary nodes as seen from the Earth are seldom opposite each other. For Mercury and Venus they can be in any angle including conjunction. For Mars they can be in trine. For the rest they tend to be more nearly opposite but for Jupiter they can approach quincunx. Furthermore, only the nodes of the Moon, Mercury and Venus circle the zodiac. Each Mars node varies over 3 signs, each Jupiter node varies over nearly one sign, and the rest vary over an average of six degrees each. For major aspects of orb one degree, and excluding aspects between the nodes of Jupiter through Pluto (which are either very non-random or impossible), the average chart contains about 8 planet-node aspects and 4 node-node aspects, which more than doubles the average count per chart of 10 major aspects between planets using 5° orbs (*Recent Advances* 1977:263, 294). So nobody should be surprised by the ability of planetary nodes to explain everything in birth charts that do not already explain everything.



7.7.1996.1 An astrophysicist looks at astrology

The Polish astrophysicist Dr Slawomir Stachniewicz became interested in astrology in 1983. He is the author of numerous astrophysics papers specialising in the evolution of stars, and has written a maximum-accuracy computer program for calculating birth charts. Three astrology articles written 1995-98 and published on his website stachnie.republika.pl list the areas of astrology that to him are in need of verification, and various physics-based (and often highly technical) equations that might describe how they work. Two are also available on cura.free.fr. The following summary (checked by personal communication in 2017) omits equations and lists areas in need of verification. Many may be familiar. The rest show how to an astrophysicist they are even more numerous than we might imagine.

Astrology is not a science. It is a set of recipes collected during 2000 years that often disagree with each other. It is like the earliest medicine, which made progress only when its ideas were tested. If I point out facts that do not support astrological ideas, most astrologers say *down with facts!* Which emphasises the greatest weakness of astrology today, namely its lack of empirical verification. Questions [here paraphrased] requiring investigation include:

How important is atmospheric refraction and geocentric parallax, should we use the apparent visual position of planets or their actual position (ie corrected for light travel time), what about apogee effects and nodes, should we use the Moon's mean node or true node, do latitude effects depend on geographic hemisphere, do houses exist in polar zones, do cusps mark the beginning or middle of the house, which system of houses and signs should we use, how does house and sign strength vary, how does meaning change near sign and house cusps (abruptly or gradually), what effect does ecliptic latitude and declination have, does RA have any meaning, when is the moment of birth (first cry, first breath, or something else), which stars are important, in directions what is the correct shift (1°, 0° 59' 8", or something else) and the correct kind of year (tropical or sidereal), how do aspects work (resonance?), do they depend on ecliptic differences or on their real angular separation, does latitude make a difference, why is the ecliptic used instead of RA or galactic longitude, what is the relevance (if any) of the Spring Equinox Point, what is the actual effect of house position and zodiac signs, how does an aspect's influence vary with orb and on what physical principle is it based (magnetic, electromagnetic, strong, weak, gravitational?), how should we calculate planetary strength?

All questions require investigation if we are to know more about them. Everything needs to be checked. The lack of empirical guidance has caused astrology to stagnate for 2000 years. But computers are revolutionising astrological research, so now the crucial thing is obtaining data rather than making hand calculations. But we must always take care to avoid artifacts.

Comment Astrophysicists with astrological interests are rare, but Dr Stachniewicz is not alone. In 1997 the US astrophysicist Dr Victor Mansfield (1941-2008) gave a talk at the Cycles and Symbols Conference in San Francisco on "An astrophysicist's sympathetic and critical view of astrology". To him truth was the first victim when uninformed scientists and uninformed astrologers argued. His subsequent account of astrology, synchronicity, parapsychology and associated subjects was spoilt by his own evident unfamiliarity with artifacts, but he saw how the growth of astronomy into a golden age had been dazzling. It suggested that:

with a coherent theory and the modern tools of psychological testing, sophisticated statistical methods, and modern computing, astrology can make a similar leap into a golden age of its own (www.lightlink.com/vic/astrol.html).

He stressed he was not cramming astrology into a framework unsuited to its symbolic depths,

but was seeking only "verified correlations from which the banner of astrology can wave".

But unlike Stachniewicz (see 7.4.2009.2) he made no actual tests. Nor did he approach the topic in the scientific way that the US astrophysicist Dr Peter Sturrock does as described in *Zetetic Scholar* 7, 96-98, 1980. Sturrock's focus is UFOs, but any paranormal area including astrology would fit equally well. His approach (in 1980) stresses the need for replication:

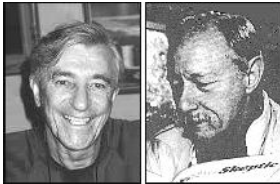
The question to be addressed is how one can best advance our understanding of the phenomenon in terms of a continuation of the present stream (some would say trickle) of admittedly soft evidence. This situation is very different from that which is encountered in normal science. In our normal scientific activity, we have a very secure data base. This is not to say that, as a theoretical astrophysicist, I believe every result published by observational colleagues. When a group of observers announce a startling new discovery, I do not normally accept the announcement at face value. My practice is to wait and see if the discovery is confirmed by an independent group (p.96).

And that is precisely the problem. Nearly four decades later, despite modern tools and methods, correlations commensurate with astrological claims *and that replicate* are nowhere in sight. Worse, almost every question we could ask about astrology has in effect been brushed aside by endless speculation. Astrologers still have no idea why astrology seems to work, but their experience tells them that it does. So if empirical tests fail to confirm their experience, they question the tests, not their experience – an attitude long known to be fatal.

Today hundreds of tests have shown that astrology works by the very human predisposition to see faces in clouds helped by hidden persuaders, so Stachniewicz's questions and associated equations are now beside the point. Astrology does not work in a way to which they would be relevant. Nevertheless they illustrate the sheer diversity of areas that are open to an unwise reliance on uncontrolled experience, which of course is not a problem unique to astrology.

7.7.1996.2 Top skeptic meets top astrologer down under

Harry Edwards. Yellow Pages–Yellow Psychics?/The Astrologer and I. *The Skeptic* [Australia]16(3), 29-34, 1996. Top skeptic Edwards sent letters to each of 30 psychics (some were astrologers) listed in the Sydney yellow pages. He invited them to enter for the \$650,000 then on offer for proof of paranormal ability. One astrologer accused him of harassment (*oh that someone would harass me with \$650,000 to demonstrate what I do for a living!*). None accepted.



Left: UK-born John Clarke 1932-2005, a great pioneer of Australian astrology. He was friendly, thorough, dedicated, and convinced that astrology works. From the late 1970s at his *Sydney Astrology Centre* (pictured) he gave classes and chart readings.

Right: UK-born Harry Edwards, then 69, national secretary of Australian Skeptics, a world traveller (85 countries), writer (6 books and 200 articles), former seller of horoscopes, plus more extreme life events than most. A top subject for a top astrologer.



The Astrologer and I Excerpts as reported by Edwards. *Italics Clarke* (from pp.33-34):

When you were 21 years old there was a very important change in your life. It changed your life very dramatically. That would have been a very difficult time for you ... things were cut out from underneath you. This could apply one or two years either side. •The fit of the chart has now been broadened to cover four years from 19 to 23. In part it was correct. I was a young man of 21 when I came to Australia. My life did change, but it was not a difficult time in any

respect, and I never felt that things were cut from underneath me. I pointed to what he had not seen – that Uranus and Mercury indicated travel. John then queried my birth time of 2am since it was rare to know it.

How do you know? •My mother told me. John then talked about how the birth moment was defined, admitting that astrologers can't agree, thus negating any pretence of accuracy when equating 4 mins of chart time to one year of life.

Can I ask about brothers and sisters? •One brother, 3 years younger than me. But why didn't he show up in my chart? Further, my brother didn't show up in my chart where he should have, but John's adjustment soon fixed that!

Your Sun in Scorpio and Moon in Sagittarius, with a semi-square aspect between the two, indicates that when you were very young you in some way saw your mother and father to be in conflict, with a lack of closeness to both parents and a build up of resentment. •The only event of significance was being badly scalded after pulling a kettle of boiling water off the stove onto myself when I was three years old. But it didn't show up in my chart. As for the lack of closeness I could not relate to anything of this nature. My parents gave me all the love and attention that parents could have

given, and the sacrifices they made in difficult war times qualify them for martyrdom. Resentment? Absolutely not.

In your chart there is a really strong intellectual influence, the ability to put things together, you would like to create a philosophy, a concept by which you would like to live your life. It may even be religious – there was a restriction in your early life. •With the exception of a religious bent, part of this may be close, but there has never been any restriction.

This indicates that you are very emotional, you have this strong need to express – things tend to fall to pieces when you think you have everything together – you have this great mind but it cannot make up for the lack of strength •Again how relative is the strength of my emotions compared to others? As for things falling apart, I've had my ups and downs, but there is nothing that this would relate to. It's a case of one's memory versus the astrologer's persuasive assertions.

Significant events in my life included wartime experiences; my first love; two years in communist Czechoslovakia; marriage, divorce, children and grandchildren; the heartfelt loss of both my parents; the near loss of my eldest son with a heart attack; watching my young brother physically deteriorating with Parkinson's disease; thrown off a horse; extensive travel experiences; two narrow escapes from death, one on a motorcycle the other in a gas explosion; hospitalisation with first, second and third degree burns; an operation; having root canal therapy without anaesthetic; a near arrest by Burmese railway police; revolutions in Greece and the Philippines; shipwrecked; mugged in Panama City; a trek through the Golden Triangle; a six year legal battle; my first time on water skis; learning to snow ski (carried off on a stretcher); a maiden voyage from Sydney to Hobart in a home-built concrete yacht weathering four force-eight storms; seventy rejections from book publishers. None could be specifically seen by John in my chart.

Edwards' Conclusion: Given the vague generalisations and after-the-event validation, I can understand why the uncritical would probably accept that John's method of rectification was accurate. But of what value is it as a guide to the future? John could not tell me, precisely or specifically, what an indicated event was, nor to within several years when it did or would take place. Like Nostradamus's quatrains the system is wide open to interpretation. Given the number of events great or small that occur in a persons life, it's not very difficult to make some of them fit (p.34).

Comment No chart is provided, and the tape ran out halfway, but the meeting illustrates how astrologers tend to judge astrology by its meaning and skeptics by its truth, thus reaching opposite conclusions. No world traveller as seasoned as Edwards will be in need of meaning.

7.7.1996.3 Theories of astrology

Geoffrey Dean, Peter Loptson, and Ivan Kelly, with seven others (Joanna Ashmun, Suitbert Ertel, Frank McGillion, Arthur Mather, Rudolf Smit, Patrick Curry, Susan Blackmore) who helped with an earlier version. *Correlation* 15(1), 17-52, 1996. The most comprehensive review in print with 84 references, most of which are omitted here.

The word *theory* has two different meanings. In *everyday* use it means an unsupported idea as in "it's only a theory." In *science* it means the exact opposite, namely a well-supported idea as in the theory of relativity. Both kinds of theory are explanations for how things work, and we bother with them because they are useful: (1) Explanations are better than uncertainty, even untrue explanations as when misfortune was explained by witches. (2) Knowing how things work is better than ignorance. For example it helped us walk on the Moon. In what follows we exclude explanations characterised by vagueness such as that of Shallis based on unexplained Principles (see end of 7.7.1989.4), We also exclude explanations that treat astrology purely as a language without considering content, which leaves nothing to be explained.

Spiritual theories view astrology as soul stuff, dealing with things other than the material, which is unproblematic provided no claims are made for astrology other than spiritual ones. But no astrology conference or book stays within purely spiritual limits. And cases where there is no living chart owner (ships, companies, countries, questions) seem to deny that astrology could be fundamentally soul stuff. Spiritual explanations can differ just like other explanations (eg Alice Bailey's seven rays, Charles Carter's pathway of the soul, Alan Leo's karma, Dane Rudhyar's actualisation, Robert Schmidt's Greek principles), but being spiritual they are by definition untestable, in the same way that presents under the Christmas tree do not decide between Santa Claus and parents. So such explanations are not useful.

Physical theories reduce astrology to physics via two approaches. One is to stay with an extended conventional science, as in explanations based on the pineal gland vs interstellar radiation vs resonance. The other is to move beyond conventional science as in implicate order vs holographic order vs morphic resonance. Both involve two problems: (1) Precise details are missing about how things like "Moon opposition Saturn indicates problems with your mother" are explained. The links with say seasonal effects may be clearer, but this no more explains

astrology than does getting up with the sun or having barbecues on moonlit nights. So they boil down to leaps of faith. (2) In principle all physical explanations must fail when there is nothing for physical forces to act on (ships, companies, questions, progressed charts).



Alchemical origin of *as above so below*. For at least 1500 years alchemy flourished in the chief centres of civilisation. Its focus was the hidden reality underlying everyday life. Like astrology it followed the Hermetic doctrine of *as above so below*, as expressed in the *Emerald Tablet* or the *Emerald Table of Hermes*, a famous 9th century alchemical document that refers to distillation as pictured in this 16th century wood-cut. The distilled vapours **above** are from or like the liquid being heated **below**, so one must reflect the other (Merkur, *Ambix* 37, 35-45, 1990; B Moran, *Distilling Knowledge* 2005:27). Distillation purified the subtle from the gross, so it was of key importance to alchemical beliefs. Although alchemy was habitually shrouded in secrecy and was not subject to the same scrutiny as astrology, it fell into disrepute as soon as "the imponderable spirits – the effluvia, the electric fluid, the matter of light, phlogiston, caloric, the animal spirits, and the like – became discarded from science and man ceased to be able to think in terms of [mystical] breaths and influences" (F Sherwood Taylor, *The Alchemists* 1976: 173). Note the problem – the theory of *as above so below* explains astrology in terms of pure materialist physics. The lesson from alchemy is to ask a simple question – on what grounds might astrology survive when alchemy has not?

As below, so above is an inescapable consequence of *as above so below* regardless of how outcomes are explained. It predicts that changing a marriage date or a journey destination will be reflected by changes in the heavens consistent with astrological claims. It requires no birth data or timed observations, which is a huge advantage, but has been universally disconfirmed by observation. So it is not going to be useful except in the sense of falsifying astrology.

Informational theories treat information like a physical quantity such as energy. But unlike energy (the stuff of causation), information is weightless and energyless and therefore does not imply causation. Many astrologers routinely refer to astrology as "non-causal", so information seems a promising theory. But how much information is in the heavens compared with the birth chart, and how quickly can that information be transmitted? The information content of a message or picture or birth chart can be measured by the number of yes/no instructions or bits (0s and 1s) needed to construct it. If we have N equally-probable symbols, the number of bits required to select any one of them is $\log_2(N)$. So a sun sign would take $\log_2(12) = 3.5$ bits. Planet and house positions to the nearest degree would require about 1500 bits, whereas to select a chart meaning from a pre-existing set of all possible meanings (total about 10^{186}) would require about 620 bits, a notable saving over 1500. To receive information requires some kind of carrier wave, where a frequency range of B cycles per second (B is called the bandwidth) can carry something like $6B$ bits per second. For example in human speech the transmission rate is about 10 bits per second. The highest frequencies available in the heavens are planetary diurnal frequencies of around one cycle per day or 0.00001 cycles per second, so the transmission rate cannot exceed 0.00006 bits per second. To transmit 620 bits would take $620/0.00006$ seconds or around 120 days, far too long to match any moment of birth. Even selecting one sun sign out of 12 would take $3.5/0.00006$ seconds or around 16 hours. So informational theories of astrology seem as unpromising as physical theories.

Psychic theories see astrology as arising from psi or the astrologer's psychic ability. which raises the classic problems of psi such as the absence of criteria for deciding whether psi is present or absent, the severe incompatibility of psi with the findings of neuroscience, and its negative definition (psi is what remains after all known normal explanations have been eliminated, so where does that leave normal explanations not yet known?). Also controlled tests have shown that even leading psychics do not have useful psychic abilities, see 8.9.3. In effect psychic theories replace one mystery by another and are therefore not useful.

Magical theories are based on magical correspondences or arguments by analogy, the assumption that things similar in some respects are also similar in other respects. Mars the red planet indicates red-related things like blood, anger and war, and thus by extension anything vaguely red, hot or aggressive. Ancient Hermetic writings contain eloquent examples:

The macrocosm has animals, terrestrial and aquatic; in the same way, man has fleas, lice, and tapeworms. The macrocosm has rivers, springs, and seas; man has intestines. The macrocosm contains breaths [winds] springing from its bosom; man has flatulence. The macrocosm has Sun and Moon; man has two eyes, the right related to the Sun, the left to the Moon. ... The macrocosm has the twelve signs of the Zodiac; man contains them too, from his head, namely from the Ram, to his feet, which correspond to the Fish (from MacNeice, *Astrology* 1964:126).

However: (1) We have no immediate way of choosing between opposing correspondences. Black cats were lucky to ancient Egyptians but unlucky to medieval Europeans. The Moon was male to the Babylonians but female to the Greeks. The same piece of sky means one thing in Western astrology and another in Eastern astrology, see 3.14. (2) It is impossible to specify any two things that do not show some kind of correspondence. Even Lewis Carroll's famous raven and writing desk are alike because both begin with an "r" sound and both cast shadows. (3) History shows our chances of success are not good. No longer do we believe, as Aristotle did, that death can occur only at low tide. No longer do midwives open the door to ease a painful labour. No longer do alchemical ideas appear in practical chemistry courses. Magical correspondences have been such notable failures that in Western education today they survive only as examples of fallacious reasoning. Magical theories have no hope of being useful.

Time quality and synchronicity theories due to Carl Jung are popular with astrologers but are neither plausible nor useful, see 7.6.1952.1 (Jung's astrological experiment).

Conclusion. None of the above theories seem useful. All they suggest is "astrology works because it works". Nobody given these theories could end up being an astrologer.

In contrast to all this, astrology is readily explained by the failure of astrologers to control for non-astrological factors, which are then mistaken for genuine astrological effects. This failure is a useful theory that explains the universal experience of astrologers that astrology works but not when artifacts are controlled. It explains why neither astrologers nor clients have been able (under blind conditions) to tell wrong charts from right charts, and why tens of thousands of Western astrologers can disagree with hundreds of thousands of Eastern astrologers over the meaning of the same twelve pieces of sky. It also leads to testable predictions such as:

- There will be mutually incompatible techniques that are nevertheless seen as valid by their users.
- Subjects will be generally unable to distinguish authentic readings from controls.
- Judgements by astrologers using authentic charts will be no better than those using control charts.
- The more biases and artifacts a technique contains the more effective it will seem.
- No predictive technique including horary will consistently perform better than chance.

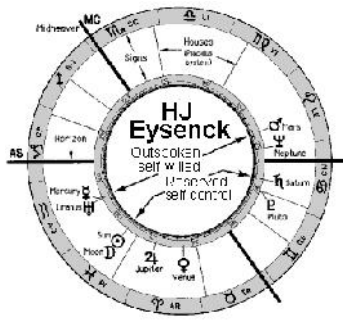
In short, such a theory meets all our requirements. It explains the observations, improves on existing explanations, suggests new areas for testing, and does not contravene existing knowledge. No other theory comes close. It is also the only theory to have withstood international attempts to disconfirm it, see 8.9.10.2.

7.7.1997.1 Professor H.J.Eysenck 1916-1997

Eysenck was arguably the most influential psychologist of his time. He was noted for his insistence on measurement, his stupendous clarity, and prodigious output (over 1000 articles in scientific journals and nearly 80 books, one on astrology). From an obituary by Geoffrey Dean and David Nias, *Correlation* 16(1), 48-54, 1997 and updated by them.

Hans Eysenck was born in Berlin to gifted actor parents, his father specialising in comedy and his mother in silent films. At age 2 his parents divorced leaving him in care of his grandmother. At age 18 he left Germany because tertiary study required that he join the Nazi party, which he refused to do. He went first to France, where he studied history and literature at Dijon University. But because he liked English poetry and writing more than the French, he went on to England, where he applied to study physics and astronomy at London University.

Eysenck's early view that astrology was nonsense was supported by his birth chart based on his birth certificate for 4 March 1916 Berlin 4am GMT. He had a quiet, soft-spoken manner quite unlike his popular public image of tough-mindedness. His chart is dominated by two configurations. Top is a close conjunction of Mercury and Uranus opposite Mars, indicating outspokenness and self-will. Bottom is an unusually exact (to the minute) conjunction between Sun and Moon trined by Saturn, indicating reserve and self-control. It seems like an uncanny match. But if as a control we take the opposite personality (loud, outgoing, easily upset, submissive, lacking in confidence), there



is again an uncanny match, especially as both Sun and Moon are in Pisces, indicating a double dose of sensitivity and passivity. In other words his chart reveals little about traditional astrology other than its ability to describe anything in retrospect.

But by mistake he had not taken certain vital courses. It was either wait another year or enter the only science subject that his courses allowed, namely psychology, which he had never heard of! "Thus is one's fate decided by bureaucratic stupidity" he said. Later he realised that competition in physics was much fiercer than in psychology, leading to a much harder life, so he felt that the fateful decision may have been for the best.

The scientific approach to psychology. His PhD thesis, completed in 1940, looked at how artistic judgement and taste (for pictures, for poetry) varied among individuals. He found that there was some objectivity, so there were genuinely good and bad judges. A work of art was "better" if it contained both complexity and order, and there was generally more agreement than disagreement between experts and lay persons. But their preference still depended on their personality. For example extraverts preferred loud jazzy pictures and unsubtle poetry whereas introverts preferred restraint and subtlety. Recognition of this now-unremarkable dependence on personality is still absent from most university art departments.

When he started in psychology the field of personality was in a terrible mess, with thousands of apparently different theories each supported or condemned by rival schools. In due course he developed the *Eysenck Personality Inventory* (1964) for measuring E and N, and the *Eysenck Personality Questionnaire* (1975) for measuring E, N, and P, both becoming very widely used tests in psychology. Today, 50 years later, there is virtual consensus that there are just a handful of independent dimensions, commonly ranging from Eysenck's E, N, and P to the Big Five.

Each of his major areas of interest (behaviour therapy and personality theory) have associated journals founded by Eysenck, namely *Behaviour Research and Therapy* (1963) and *Personality and Individual Differences* (1980), or BRAT and PAID for short. Today (2018) both are thriving and both are leaders in their fields.



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Eysenck (right) with Nias, Smit, Dean and Ertel in 1992 in the tea rooms at the Institute of Psychiatry, for 30 years the standard place for meeting Eysenck.

Fringe topics. Eysenck's interest in fringe topics began at 18 when he was a student at Dijon University. He had pretended to be a graphologist (which he wasn't) but his shrewd use of Barnum statements had generated wild acclaim. His curiosity over what was happening led to occasional tests of graphologists over the years, but ultimately to the conclusion "there is very little relationship between personality and graphological analysis" (*PAID* 7, 263-264, 1986).

Such topics were controversial but what mattered was a core of testable ideas. It was their testability, plus apparently positive results, that attracted Eysenck's attention. He said "the main attraction of a field such as hypnosis (or parapsychology, or astrology), is the promise it contains of entirely new and extremely important knowledge that might be gained by a study of the (alleged) phenomena in question" (*Rebel with a Cause* 1990:233).

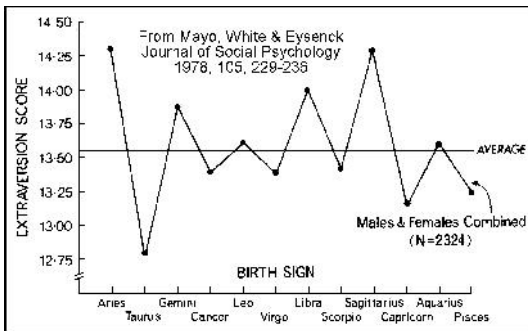
Interest in astrology. Eysenck was involved with astrology mostly during 1975-1985, ten years after he became involved with parapsychology. His interest in astrology was sparked by a chance meeting in Paris with Michel Gauquelin, who at the time was an editor of *Psychologie d'Aujourd'hui* and was keen to interview him. Gauquelin took the opportunity to pass on some

results from his astrology research including the Mars effect. At the time Eysenck considered astrology to be nonsense, so he expected to uncover serious procedural errors. Instead he was impressed by Gauquelin's academic standards, and he gave a favourable review of the Mars effect results in the now-defunct magazine *New Behaviour* for 29 May 1975, commenting:

I think it may be said that, as far as objectivity of observation, statistical significance of differences, verification of the hypothesis, and replicability are concerned, there are few sets of data in psychology which could compete with these [Gauquelin] observations. ... I think we must admit that there is something here that requires explanation (p.248).

In the same article Eysenck took issue with Karl Popper's argument that astrology, like psychoanalysis, is a pseudoscience because it consists of untestable assertions. Eysenck argued that, on the contrary, astrology does make testable assertions such as those linking certain planetary positions and personality. So "there should be no difficulty in arranging an experiment to test the hypothesis quite unambiguously".

At the time of his *New Behaviour* article Eysenck was also becoming involved in a test of sun signs. In 1971, the British astrologer Jeff Mayo had sent Eysenck a study of 1795 subjects in which their mean scores on Mayo's extraversion questionnaire were plotted against sun sign. The results showed a zig-zag pattern completely in accordance with astrology. Eysenck was intrigued and made the EPI available to Mayo for further tests. Then in 1973, independently of Mayo, the British sociologist Joe Cooper showed Eysenck a study of Bradford University students whose mean E scores plotted against sun sign showed the same zig-zag pattern.

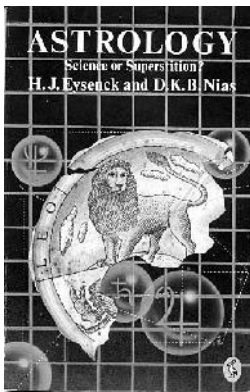


The outcome was a paper by Mayo, White & Eysenck in the 1978 *Journal of Social Psychology* detailing the EPI results for 2324 subjects, followed in the same journal by a paper by Smithers & Cooper detailing the EPI results for 559 students. In each case the result was a zig-zag pattern in agreement with astrology. See also 8.3.7.

The Eysenck paper was hailed by astrologers as "possibly the most important development for astrology in this century" (*Phenomena* 1, 1, 1977). But Eysenck later found that the effect disappeared when people unfamiliar with sun-signs were tested. It was due not to astrology

but to people role playing their sun sign meanings. The bias may be tiny but in large samples it can attain impressive significance, as in this case $p = 0.000005$ for $N = 2324$.

At about this time he received a copy of *Recent Advances* in return for his help with personality and psychology. Already inspired by Gauquelin's work, he decided another popular scientific book was called for. So, as a follow-up to their successful joint 1978 book *Sex, Violence and the Media*, he gave David Nias his collection of relevant journal articles (photocopies later formed a pile 0.5m high) to make notes on so he could dictate the results into a book. But the notes



were almost enough (in the interests of accuracy Nias had invited comments from outside critics), so he made only a few changes and expanded the first and last chapters. His publisher copy edited it to ensure a more popular appeal, and in 1982 published it as:

Astrology: Science or Superstition? It covered basic astrological principles, sun-signs, marriage, illness, suicide, appearance, time twins, season of birth, terrestrial and solar cycles, radio propagation, earthquakes, lunar effects and the Gauquelin work. Care had been taken to be independent and to get the facts right, with about 40% of the book's 230 references being additional to *Recent Advances's* 1020. In 1984 it appeared in a Penguin edition (pictured). It has also been translated into at least seven languages, the latest being Norwegian.

Apart from reviewing the evidence for astrology, it made two key refutations. The zodiac zig-zag was shown to be an artifact of prior knowledge, and the claims of John Nelson (planetary positions can predict shortwave radio quality with about 90% accuracy) were shown to rest on an artifact in calculating the accuracy rate. Both artifacts have been confirmed by others. There were various non-astrological explanations for other claims, for example much of the acceptance of chart readings was explained by the Barnum effect, and matching tests were ruled out as decisive evidence due to their small sample sizes. Only Gauquelin's Mars effect remained beyond explanation. Here Eysenck was to later react positively to the early evidence for social artifacts, see 6.10 ff, although he did not live to see its completion.

His interest in astrology helped to launch London Research Conferences and three overseas Eysenck Research Seminars, the first of which led to the formation of CORA, the Committee for Objective Research in Astrology, with 12 members and Eysenck as Chairman. It aimed to counter the poor quality of astrological research by providing free advice. But few enquiries were received, most did not proceed further, and it did not survive Eysenck's passing.

Eysenck's contributions to astrological research were his insistence that researchers should always (1) decide issues by facts, (2) be clear and informed, (3) insist on testability, (4) promote critical thinking by discussion, (5) work hard and persevere, and (6) be helpful and approachable, for details see 2.13. He set an inspiring example of open-mindedness and good science that everyone can aim for but few will achieve.

Response by astrologers. In general they have praised his favourable comments, condemned his unfavourable ones, and dismissed as ignorant and deluded anyone adopting his scientific approach to astrology. One said "I am puzzled why some astrologers ... feel a need to be accepted by self-styled proponents of rationality" (*Astrological Journal* 24(3), 198-200, 1982). No doubt Eysenck saw this as an example of the phrase he had framed many years earlier to characterise true believers, namely "my mind is made up, don't confuse me with facts".

Opposites prevailed. Despite his influence on clinical practice, he never practised therapy himself. Indeed, he often said he was not a good psychologist in the layman's sense of having an intuitive understanding of other people's reactions. But the opposite prevailed in sports psychology – although he claimed never to have practised seriously, he continued playing an hour or two of tennis or squash each weekday until he was 80.

Opposites also prevailed when he met Sybil, later to become his second wife. The equity theory of love and marriage says that advantages and disadvantages for both partners should be roughly equal if the partnership is to be successful. She was young, pretty, and vivacious; he was older and poverty-stricken. She was extraverted, sociable and used to going out; he was introverted, a reader of books and used to staying at home. She was extremely low on psychoticism; he was much higher. But she had virtues not normally associated with extraversion like extreme efficiency and punctuality, and had a neuroticism score compatible with his own zero score. She also had an intuitive understanding of his work, and later made significant contributions to it. Their lives became inseparable, and in over forty years of marriage they never had a serious quarrel. He always remembered their first meeting at a daily discussion group: "I have never believed in love at first sight, and still don't know whether it exists, but what I felt at that moment must have come pretty near to it" (1990:110).

7.7.1997.2 Harmonics: a revolution in astrology?

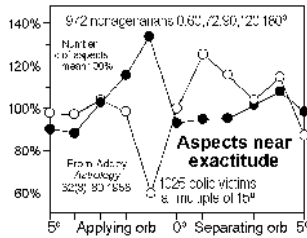
Expanded from Geoffrey Dean, John Addey's Dream, *Correlation* 16(2), 10-39, 1997.

The research area once recognised in the UK as being most likely to revolutionise astrology was John Addey's harmonics, described by Charles Harvey as likely to:

transform our conception of the inner relationship between cosmos and psyche [with] many startling and provocative insights into the underlying nature of astrology (preface to Addey's posthumous *A New Study of Astrology* 1996:v).

Addey was a remarkable combination of lucid and eloquent writer, practical mystic, inspiring organiser, brilliant theoretician, and unflagging experimentalist. His revolutionary research and astonishing labour (almost full time for twenty years) began in the 1950s after becoming dissatisfied (thanks to Peter Roberts) with the unscientific nature of astrology. Therefore:

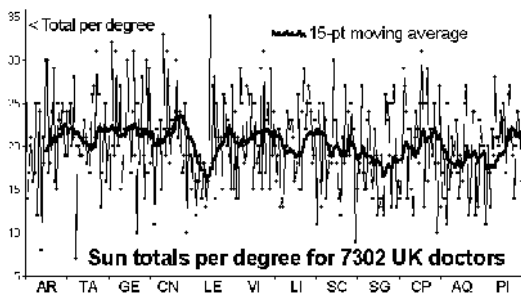
In 1955, after almost twenty years of active interest in the subject, I set myself to try to discover and demonstrate, if possible, a secure scientific basis for astrology. Being wholly convinced of the truth of this study I believed that such a demonstration would be relatively easy. I was mistaken. ... All the usual possibilities were explored and a good many others besides. Yet so far as my original purpose was concerned I had to admit that the results at this stage were very disappointing indeed. I had found nothing that I could confidently regard as dependable. No one could have been more surprised, or pained, by this negative discovery than I was (Addey, *Selected Writings* 1976:159,163).



But things changed when Addey looked at the distribution of aspect orbs at the births of 970 nonagenarians and 1025 polio cases. When the number of cases was plotted against orb near exactitude, the results showed intriguing wave-like shapes:

When I began this work I had no knowledge whatever of these matters, but it was gradually borne in upon me that the results produced could approximate to a system of superimposed wave-forms (*Selected Writings* 1976:171).

Later the idea was supported by the zodiacal Sun positions at the birth of 7302 UK doctors. Thus was born the idea of harmonics. The solar positions did not fall into box-like groups as predicted by the doctrine of signs but formed a continuum in which wavelike fluctuations were noticeable. Other large sets of solar positions showed the same fluctuations. The most predominant waves were sometimes the traditional ones, such as 360/4 or 360/12, but were usually more subtle, eg 360/13 or 360/125.



Degree totals and moving average (black line) for Sun at birth of 7302 UK doctors (*Recent Advances* 1977:150).

After twenty years of work, Addey concluded that all integral divisions (ie harmonics) of 360° were valid, whether as signs, houses or aspects, even when the resulting interval was one degree or less. He had found that each harmonic seemed to have its own meaning. So the

key things in astrology were not signs or houses or aspects but the size of the interval, its relation to 360° (ie its harmonic), and what comprised the points at each end. Or as he put it, "all astrological effects can best be understood in terms of the harmonics of cosmic periods".

JOHN M. ADDEY
M.A. (Cantab.), D.F.AstroI.S.

PRESIDENT OF THE ASTROLOGICAL ASSOCIATION

The theme of this, the second Charles Carter Memorial Lecture, is that astrology is evidently about to undergo a rebirth and a period of new growth. It will be no ordinary rebirth and no ordinary period of growth. From being an outcast from the fraternity of sciences, it seems destined to assume an almost central role in scientific thought.

He was not alone in such views. In 1978 Dr Heinz Fidelsberger of the Vienna AS announced:

The Vienna Astrological Society has been engaged for more than 15 years in laying down the scientific foundations of astrology. It is hard to see why astrology is denied a scientific basis when the opposite is true. ... We astrologers know for certain that the conclusions of all the research activities of exact science in the coming years will confirm, not refute, astrology. ... Astrology is well on its way to becoming an exact science" (*AFA Bulletin* 40(5), 22-23, 1978:23).

Addey and his associates were convinced that harmonics would not only have a crucial impact on astrology and science, it would be quick, and it would happen sooner rather than later:

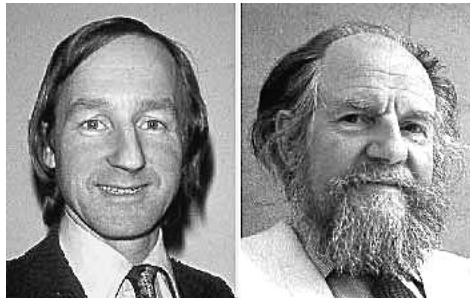
Harmonics, after all, is simply an attempt to clarify, restore, and make astrology more coherent and intelligible. Perhaps within one generation, say ten years, harmonics will be moving into the very center of astrological thinking. Harmonics is really an extraordinarily simple concept. It is simple to apply: and once used and developed, it will be a

By 1971 Addey was so convinced by his findings that he was able to make ◀ this famous quote in his Charles Carter Memorial Lecture (reprinted in *Astrology Reborn* 1971: 3) about the future importance of astrology.

tool which will tell us far more about any chart.... Astrology will be restated in terms of harmonics or whatever they become, and this will be the new traditional astrology (Mark Feldman, Harmonics in astrology [an interview with James Williamsen, John Addey, and Charles Harvey] Dell *Horoscope* 65(12), 10-11 & 29-30 December 1977).

Addey's argument is essentially this: **(1)** Before the Renaissance, matter was subservient to spirit (a cynic might interpret this as you did what the Church said). **(2)** During the Enlightenment, spirit slowly became subservient to matter (you did what science said). **(3)** Today we are slowly returning to spirit at the top (you ignore science because science is hard work and spirituality has something for everybody). Spirit at the top has always been an integral part of astrology, hence astrology is about to be reborn. Not the old astrology based on anything goes, but a new demonstrable astrology based on the harmonics of cosmic periods. He points out that mankind has had "three demoralising experiences" – earth was not the centre of the universe, evolution was not due to God, and man was not as rational as he believed – adding:

But a fourth and I believe still more shattering experience lies just around the corner and its impact will be felt in the next twenty years. It is the revelation of just how far the ebb and flow of human events and activities take place in response to the all-various pressures of cosmic forces (*Astrology Reborn* 1971:23).

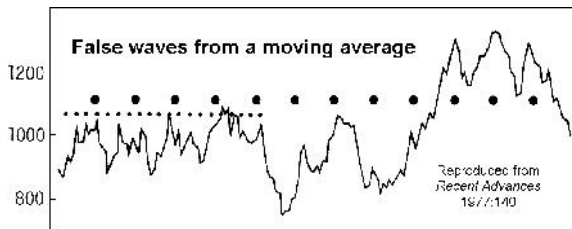


Left: Charles Harvey (1940-2000), President of the AA 1973-1994 and a key link in the astrology-science debate. Without Charles there would be no *Recent Advances*, no *Correlation*, and most probably no works like this one. See 7.2.2000.1.

Right: John Addey (1920-1982), President of the AA 1961-1973, editor of its journal 1962-1972, and unflagging experimentalist.

Both pictures were taken in 1976 at the end of their long involvement with *Recent Advances*.

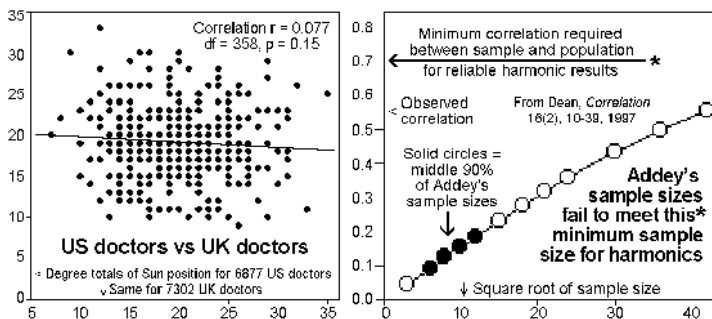
But artifacts had interfered: **(1)** Smoothing by a moving average can generate false waves:



Graph shows a 20-point moving average of a set of random numbers that span 172 data points. The first part of the curve shows only minor fluctuations with a wave about 3.5 data intervals long (small dots). The rest shows a wave of large amplitude. Overall there is a wave about 13.5 data intervals long (large dots) or exactly four smaller waves. Faced with such results we might well feel intuitively that they mean something, even if they are not statistically significant. But in this case we would be wrong. In fact both dotted

waves are false. They illustrate why harmonic waves obtained from smoothed curves are not reliable. The dots have been added for clarity, otherwise the graph is taken without change or abridgement from Brooks and Carruthers, *Handbook of Statistical Methods in Meteorology* 1953:325 (graph is also shown in *Recent Advances* 1977:140).

So the intriguing wave-like forms that Addey observed meant nothing unless they replicated – and they did not replicate, see 7.7.1977.1. **(2)** Harmonics need samples whose *distribution* (ie harmonic structure) matches that of the population. This requires much larger samples than are needed to just match means and standard deviations. But his samples did not deliver:



Left: If the wave-like forms for 7302 UK doctors mean something, they should replicate for 6877 US doctors. So this plot of degree totals should show a band of points going from bottom left to top right. But it doesn't. Scatter as expected for random data.

Right: nearly all of Addey's sample sizes were too small for the stated purpose. The results that for 20 years had been attributed to "the underlying nature of astrology" were only noise.

But by then Addey was obtaining apparent support for his ideas from the Gauquelin data, especially trait data, and these warning signs (eg *Recent Advances* 1977:150) were ignored.

7.7.1997.3 Astro-sleuthing contests for working astrologers

T Patrick Davis, *Correlation* 16(2), 3-9, 1997. A teacher of astrology for over 30 years, TPD ended her astrology practice and bookstore in 1974 and spent the next 18 years on applied astrological research.

Astrological research has two aims: (1) To find information that will help astrologers to understand and interpret birth charts. (2) To convince academia that astrology can be a source of reliable knowledge, which in turn will open new doors for astrology. Unfortunately the field is dominated by those who can see no aim except (2). So I became interested in (1), to find information useful to working astrologers. Contradictory information and methods are now an increasing affliction that boggles the mind. We need to test astrology's body of knowledge and its methods to find out what actually works. We then need to banish the unproductive factors afflicting our studies and retarding progress. This led to the idea of Astro Sleuthing Contests, which drew on my decades of experience as an astrologer, teacher, author, researcher, and concerned observer of the astrological scene intent on seeking progress.

Astro-sleuthing Contests are aimed at reaching consensus on what works and doesn't work in astrology, ranging from individual factors to entire techniques. Each contest involved:

ordinary problems, common to human life and astrological practice, and of a nature that astrologers claim can be read from a birth chart. Each involved cases taken from my private files. Previously unpublished data of the highest quality, complete and sourced, always timed to the minute, often independently confirmed as accurate by the parents, was provided for solving each problem through astrological methods. ... I identified the data as being that of a male or female, and occasionally provided a minimal clue to spur interest. No rectified or speculative data was employed. The longitude and latitude were provided from a source known to be accurate. Time standards were carefully checked. The editors were happy to allow double-checking of the typesetting to avoid typographical errors.

The required chart judgements are therefore both realistic and assessable. Astrologers are invited to send in their judgements together with details of their methods:

My approach depended on having responses from the largest possible pool of astrologers. So I contacted the two largest US organizations at that time but they showed no interest. Fortunately Aquarius Workshops Inc, a non-profit astrological organisation in Encino CA, agreed to run my contests in their quarterly magazine *Aspects*. The magazine was founded in 1975, is aimed at both beginners and experts, is nicely produced, and has a circulation of over a thousand. Contributors include well-known astrologers such as Marion March, Joan McEvers (who is the current editor), and Lois Rodden. All subscribers must sign a code of ethics similar to that of the Faculty. It seemed to me that publication of the contests in *Aspects* would be a fair test of their viability.

The nature of the contests and goal required that each problem be non-subjective, because of a need for a clear and unambiguous answer. There were no broadly encompassing questions such as "What happened?" Some problems had more than one part. All problems were designed to elicit clarification on interpretations, on methods, and various practices. Entrants could use any astrological method or procedure, but they had to show their work, provide evidence of the astro reasoning followed, and list the methods used, thereby eliminating psychic answers or guesswork. The contests were open to all astrologers desirous of testing their methods in this forum and of contributing to astrology. Those correct in their deductions were named; those who were incorrect were guaranteed anonymity. There was no desire to embarrass anyone. Aquarius Workshops provided winners with a Certificate of Recognition and prize they could select from products sold by Aquarius. I was responsible for setting up and running the contests.

As an example (no entries were required) I presented the contest by UK astrologer Charles Carter in *Astrology* 1(3) Summer 1927. What happened to a girl born 20 March 1916 at 5:40 am in London: (a) shortly after birth, and (b) on 16 August 1926? Interestingly there was a typo in the original contest, which according to Carter had ruined his contest and wasted the efforts of respondents. But it had the effect of warning the *Aspects* editor and me to double check our data before publication (we found no mistakes). Here are two of the actual contests:

(1) Three mature women. The first had never married although she had dated men. The second married at age 14, and again less than eight months after being widowed at age 28. The third had recently divorced her ninth husband. Which was which? (2) Four women. Although born at widely varying years and places, all had chosen the same unique profession while in their teen years. What was the profession?

A pilot run of six contests during 1992-1994 produced some encouraging results but had to be discontinued due to lack of interest. The general indications were alarming. They confirmed what has long been known, namely that astrological methods are afflicted by total confusion,

and that astrologers are generally unwilling to reduce this confusion by putting their methods to the test. Furthermore, astrologers whose methods clearly failed continued to use them as though nothing had happened, while methods showing superiority were ignored. This is no way to run a "profession". The problem will need to be addressed by astrologers as a whole when co-operation for the common good becomes a priority. Until then the professional astrologer will remain a contradiction in terms. TPD later commented:

After many decades of work it is clear to me that astrologers have no intention of putting their house in order. They have no interest in research unless it confirms what they already accept and use, or unless it requires no additional effort or supplies, or unless it emanates from a time period when the Earth was assumed to be flat and the center of the universe (in Dean & Mather Sun sign columns: Response to an invitation, at www.astrology-and-science.com).

7.7.1998.1 Astrology and human judgement

Geoffrey Dean, Ivan Kelly, Arthur Mather, and 5 others, namely 4 astrologers (out of 18 invited) and 1 scientist (out of 4 invited). *Correlation* 17(2), 24-71, 1998. Most of the details appear in Chapter 9. Here is an introduction:

Unless we understand the judgement processes that *underly* chart readings and their assessment, we cannot hope to understand astrology. In the psychological literature these processes have been studied for more than a quarter of a century, but in the astrological literature they have been almost completely neglected. So this article looks in detail at the judgement processes used by astrologers and their clients. The outcome is a mixture of good news and bad news. The bad news is that there are many non-astrological reasons why astrology should be judged as valid, none of which require that astrology be true (this of course is not a problem peculiar to astrology). The good news is that there are ways of avoiding the bad news.

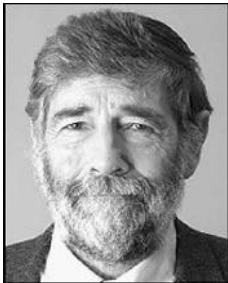
7.7.1998.2 AstroLit a pioneering database

Lex Bruining, *AinO* 11(1&2), ad on back cover.

AstroLit is a database of the international astrological literature covering books, magazines, and dissertations. It contains nearly 2000 referenced items usually with a short summary, and includes descriptions of over 150 astrology magazines past and present. The database is fully searchable. It costs 30 guilders post free (about the same as a single astrology book), or is free to those who provide new items preferably with summaries (= PISCES, a Project Integrated Source Contents Exchange Service, which is the only way the AstroLit database can be maintained). **Comment** This was another first for Dutch astrology (the author was secretary of NVWOA) but it was not successful due to lack of interest. Today, for scientific research, it has been made largely redundant by academic databases such as PsycINFO and Medline, which will retrieve many hundreds of scholarly astrology-related items despite not covering astrological magazines (which for research purposes are generally of low scholarly quality).

7.7.1998.3 Astrology is psychic engagement with gods and spirits

Geoffrey Cornelius. Is astrology divination and does it matter? *The Mountain Astrologer* 81, October-November 1998.



Cornelius (pictured) begins by stressing his background in divination:

I came into astrology directly through the *I Ching* and a love of divination. ... That means I was already comparing the horoscope with the random cut of the Tarot deck, the throw of the coins, or the division of the yarrow stalks. [But many see astrology as] evidence of a universal and impersonal pattern, at work at all times and places, lawful and not random at all, and certainly not in any way dependent on a diviner's decision to take a divination.

But astrology's roots lay in omen reading around 2000 BC in a world filled with gods and spirits who spoke directly to the diviner through omens. When astrology was later linked to *as above so below*, it lost this direct personal link with gods and spirits, leading to a "hollowness at the heart" of astrology. The spiritual nature of astrology and its relationship to the divine had been brushed aside. To restore this personal directness we need to change our view of how astrology works:

There is no technique to make signs and omens occur, but there is a ritual we make to invite the gods and spirits, and create the space wherein their sign may occur – the sacred space of the horoscope. Then we just see what comes up.

In other words what matters is not any actual birth data but our decision to (1) look at the birth chart, and (2) to see it as an omen whose meaning is in the hands of the gods whose direct answer we are hoping to receive. The message for researchers seems clear:

[Horoscopes don't work] because the heavens are influencing things at a certain moment in real time. ... Horoscopes work because psyche and emotion are brought into a symbolic equation through some device [ie the ritual of looking at charts] ... Any search for midpoints, harmonics, or other subtleties in the chart in order to try and scrape a meaning out of it is simply not fruitful. Why expect a particular moment in clock time to yield a particular pattern? A moment does not have significance until there is *somebody* there [his emphasis] for whom it is significant. From the perspective of astrology-as-divination, psychic engagement is the key to the meaningful symbol.

Cornelius accepts that parts of *as above so below* may be worthy of scientific study, and that some findings such as those of Gauquelin cannot be pushed aside, but he sees no reason to claim them as the basis of astrology when it should be gods and spirits. He concludes:

Looking at astrology this way raises more questions than it answers. What I have touched on here just skims the surface. But divination is at the heart of the issue, and how each of us answers those questions matters very much.

Comment Some astrologers dispute his views. In his 1998 book *Horary Astrology Plain and Simple*, Anthony Louis describes himself as a physician and psychiatrist who has studied and tested horary astrology ("the art of astrological divination") for 30 years. According to him and others like William Lilly, horary provides fast and accurate answers to real world problems, ie it provides the same concrete statements and predictions that Cornelius is denying.

And why should we accept that "psychic engagement" is anything other than "seeing faces in clouds"? After all, regardless of the claimed explanations of astrology (physics, *as above so below*, gods and spirits etc), it helps to have something to explain, namely a demonstration that the process works in a way commensurate with the claims. Of course it is not astrology that Cornelius is claiming to work but divination, a subjective process that depends on the qualities of the reader not an objective process that depends on information in the birth chart, where the aim (he says) is self-enlightenment rather than concrete statements or predictions. But it is still necessary to demonstrate that the process works under conditions where artifacts can be ruled out. However, neither in his article nor book *The Moment of Astrology* (1994 and 2003) has Cornelius provided such a demonstration. And judging by the tests of astrologers in 8.6 (assuming that at least some of them were proceeding by divination) neither has anyone else. And not because it is difficult – artifacts could easily be ruled out by blind tests in which the relevant variables are manipulated. More on this in the comment to 7.2.2011.1.

7.7.2000.1 Garry Phillipson challenges five researchers

From an expanded version available on www.astrology-and-science.com of Garry Phillipson's interview in *Astrology in the Year Zero 2000* of five prominent researchers (Geoffrey Dean, Suitbert Ertel, Ivan Kelly, Arthur Mather, and Rudolf Smit). The interview is now nearly two decades old but the exchanges are as applicable today as they were then.

Phillipson asks the researchers by email more than 150 questions covering the main issues of scientific research into astrology, of which 65 do not appear in his book, to which the researchers reply collectively. It took an entire year to establish the questions and the questions raised by questions. Each researcher had been investigating astrology for more than twenty years, and their publications in astrology totalled over 200 articles and several books. They accept that astrology seems to work and is meaningful, and that clients are generally satisfied, but tests show this is due to hidden persuaders and other artifacts, not to *as above so below*. In short, there is nothing about astrology that needs astrology to explain it – a view that astrologers fiercely reject. Here are the 14 Phillipson questions (shown in fine print, 6 are not in the book) that most strongly challenge this view, and the researchers' generally unabridged replies:

Relevance of scientific research

Many astrologers feel very strongly that the statistical approach is quite unsuited to astrology.

If astrologers mean *descriptive* statistics, as in births and deaths, their argument is that each chart is unique, so the success or failure of judgements for other charts is irrelevant. This is like saying each day is unique, so whether the sun rose on previous days is irrelevant. Those who depend on the sun might disagree. But if they mean *inferential* statistics, as in $p = 0.05$, astrology is said to incline rather than compel, so we have no way of knowing if a given chart

judgement is a hit or miss until after the event. It is essentially probabilistic, which means that probabilistic (ie statistical) approaches could hardly be more suitable.

Is it possible to design tests that allow for the complexity of meaning between the various chart factors?

Complexity is a non-issue because it has never stopped astrologers from practising, and we can test their performance directly in matching tests. If astrologers cannot perform better than chance then the complexity said to be responsible for their success (but which is supposedly beyond the grasp of scientific researchers) does not exist. Before we worry about complexity we need to know if astrology actually delivers, else we end up chasing phantoms.

Are there some astrological claims to which scientific research might be irrelevant?

Science requires only that events be observable in some way. If astrologers can observe the claimed correlations then so can scientific researchers. But if no observation could rule out a particular claim, the claim is untestable, and scientific research is irrelevant. It is as simple as that. We can test the idea that Leos are more generous than other signs, say by analysing the tips given in restaurants, but not the idea that Leos were Cancerians in their previous life.

What does this mean in practice?

Consider how astrologers do things. Each time they erect a chart they see how remarkably it corresponds with the person or event. They see with their own eyes that astrology works even though science (apparently) cannot explain it. This is their everyday experience, and on this experience they rest their claims. But it requires *all non-astrological influences leading to the same result to have been ruled out*. Astrologers seem to take this for granted, but researchers have to be more careful. Unless we are aware of where we can go wrong, we can look at the Earth and conclude it is flat. Things are not always what they seem.



Comment As an example try your perceptions on the stainless steel Gateway Arch in St Louis MO, completed 1965 at a cost of \$US13m. It is the tallest man-made national monument in the USA. Look closely. The Arch is 192 metres high. Now guess how wide it is. Maybe 175 metres? If you guessed less than 192 metres, you have been misled by your perceptions. Its width and height are exactly the same, as are the dimensions of this photograph. The illusion persists even after you measure it. Things are not always what they seem.

Intuition and ESP

Many astrologers would claim that successful chart reading isn't possible without some degree of intuition.

Intuition has been a rich source of inspiration in all fields of human activity including science. Yet it can be totally unreliable simply because we have no way of resolving opposing intuitions except by investigation. Astrologers generally seem unaware of this conflict. See also 8.9.2.

But surely their experience has to be good for something?

Experience of people can make us more astute, and more aware of cold-reading cues, allowing us to make better judgements in ways that have nothing to do with astrology. Experience can also bring insight. Consider this interesting test made in 1945:

Six laboratory-raised chimpanzees are put one at a time into a cage containing a stick. Outside beyond reach there is food. Will they use the stick to get it? Each animal is given half an hour. The first four have no history of stick-using, and in each case the answer is no. The fifth has used sticks before and gets the food within 12 seconds. The sixth has no history of stick-using and reaches for the food without success. After four minutes his thrashing arm brushes the stick and moves the food slightly. He stops, pushes the stick against the food, and sees it move. A few more trials and the food is his. The four unsuccessful animals are then given sticks to play with for the first time in their lives. After three days the use of sticks is old hat. The food test is then repeated, and all get the food within seconds. Conclusion: there is no insight that does not go back to actual experience (From Dunbar, *The Trouble with Science* 1995).

Of course the insight that brings a truly creative achievement may come only after months or years of hard labour and general floundering. Thus Newton did not suddenly happen on the

law of gravitation in his mother's orchard. Instead it came "by thinking on it continually".

What are the reasons for seeing ESP as unlikely to be involved in a chart reading?

At first sight ESP might explain any successes due to astrology, palmistry, tea leaf reading, and so on. But planets and hands would then be interchangeable with tea leaves, and we could not claim that such methods are valid in themselves, which presumably is not a view supported by astrologers and palmists. Also we can invoke ESP only if all other explanations can be ruled out, which would require safeguards that are generally never present during a reading.

Hostile and sympathetic world views

Would you agree that scientists tend to feel hostile towards astrology?

Scientists have to consider many things during their professional lifetime, and they have to consider them dispassionately, otherwise there is no point. But like the rest of us they are likely to show a range of attitudes towards astrology, just as they would towards religion, medicine, or politics. So if they seem hostile we might ask why. Is it because they see it as involving a commercial exploitation of untruths such as sun sign astrology? Or because they see astrology as the opposite of good science and impervious to disconfirmation? But their job is to rise above such things. Make a case based on good evidence and they will explore it.

Astrologers have pointed to numerous developments that supposedly make astrology more plausible, such as fractals, interconnectedness, the theories of Bohm, Pribram, Sheldrake, and so on.

The jury is still out on these developments. Even if science did turn out to be based on say interconnectedness, astrologers have not explained how this would support the idea that the heavens reflect what happens on Earth, let alone ideas such as Leos are generous. It is like saying astrology involves books, cooking involves books, therefore cooking makes astrology more plausible. Crucial steps in the argument are missing. Until they are spelled out, it remains circular – astrology is made feasible by the kind of thing that, if it existed, would make astrology feasible (and Leos generous). Their arguments never even get started.

What about claims that known extraterrestrial influences provide support for astrological claims?

Astrologers argue that the existence of say lunar effects on oysters proves that astrology is credible, which is like arguing that money exists, therefore everyone is rich. But how can oysters explain why only Leos are generous? Again, crucial steps in the argument are missing.

Mind and reality

Many astrologers feel your approach shows no concern for the nature of mind and the way we perceive reality.

We find this hard to understand. First, our concern for hidden persuaders is in effect precisely about such topics. Second, astrology books do not hedge their bets with such concerns, so how are they suddenly relevant? Third, what do concerns about mind and reality have to do with testing whether astrologers can pick correct charts from controls?

Most astrologers see astrology as involving an element of art as well as of science, just as in playing music. It requires a certain mental quality for astrologers to do their best work.

There is no need for alternative realities or mental attitudes or other mysteries when the claimed success is most readily explained by hidden persuaders. It is like invoking the end of the world to explain a power cut.

What about the idea that different views of reality can result in the world being experienced differently?

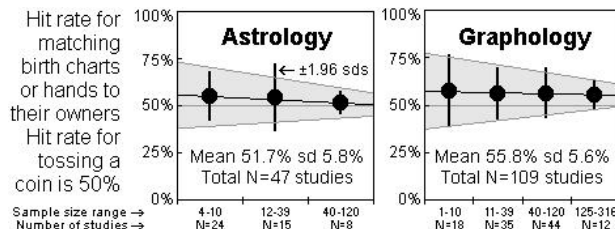
Just saying that different realities exist is no argument in favour of their existence. We need to know exactly what they entail, how we can tell one from another, and whether there are many realities or a single complex one. Nevertheless the idea of alternative realities (or truths or world views or paradigms) is popular among some astrologers on the basis that we need only find the right reality and astrology is proven beyond all possible doubt. Which is like claiming we could fly if only we could find the right reality. In short, we have no valid reason to view astrology differently just because an alternative reality might happen to be congruent with it.

The idea confuses more than it clarifies.

Perhaps astrology is just a subtle and elusive art.

The claims made in astrology books contradict the idea that astrology is a "subtle and elusive art". For example the rear cover of the reprint of Ronald Davison's best-selling 1987 book *Astrology* says its simple keyword system "allows even beginners to start interpreting charts immediately with great accuracy". Nothing subtle or elusive here, not even for beginners.

Comment 2 Just as some astrologers find our attitude to be unduly *hostile* to astrology, some scientists find our attitude to be unduly *sympathetic*. But collect all available studies and review them, as in the plots below prepared in 2001. The results will not depend on your attitude or one-sidedness. Today study numbers have increased from N=47 to N=70, but the results are essentially the same, see the plots in 8.6 (tests of astrologers).



Mean hit rates in matching tests for astrologers and graphologists. Graphology beats astrology due to personal cues in some handwritings. But neither mean differs significantly from tossing coins ($p = 0.77$ and $p = 0.30$ respectively). As sample size increases from left to right, hit rates show the expected general decrease in scatter. In each case tossing a coin would be just as accurate but presumably not as "meaningful".

Comment 3 In December 2003 Phillipson reported that responses to this interview in his book had ranged from claiming we were paid \$US400,000 by an evil organisation to hide the truth about astrology, to seeing astrologers put to shame by the validity of our arguments. Reviews by believers were predictably hostile. For example:

monolithic perspective ... little nuance ... leaves the impression that these researchers have seen (or done) all of the research and the results are unanimous (Mark Urban-Lurain, *Journal of Scientific Exploration* 18(1), 00-00, 2004).

In other words the researchers were seriously blind to quality astrology, so by definition their conclusion that astrology was likely the result of artifacts had to be wrong. This is the default argument by believers against any criticism. But does it really apply? Is it actually plausible? Read the present book, make up your own mind, and let us know. For more see 7.7.2019.2.

7.7.2001.1 Arguments against scientific research

Dennis Elwell, web articles 2001. Garry Phillipson's 2000 book *Astrology in the Year Zero* contained two chapters in which researchers Dean, Ertel, Kelly, Mather, Smit responded to 90 questions and concluded that astrology runs on artifacts. This upset UK astrologer Dennis Elwell because it gave a "completely misleading impression" of astrology. His rejoinders for the Year Zero website totalled 30,400 words from which the following arguments are taken. His rejoinders were accompanied on the website by the researchers' rebuttals shown here in smaller italic print.

Astrology does not respond readily to quantitative and reductionist methods.

They work well in the social sciences including counselling. Why should astrology be different?

Your chapters left me angry because you are impervious to contrary arguments.

We keep asking you to describe better tests, but your silence gives us nothing to be impervious to.

Astrology needs to be examined in its own terms, not artificial terms.

As if it were impossible to give astrologers two charts and ask them to decide which one belongs to X. Good studies require good design, controls, and proper evaluation, but here you provide no input.

Your approach seeks to isolate, whereas astrology seeks to connect.

The claimed connections could be due to artifacts and reasoning errors. We can find out for sure only by controlling such artifacts and reasoning errors, which is an approach you show no interest in following.

Suppose astrology is a different science and needs a different methodology?

Suppose it isn't and doesn't? We can all play this "if" game. It leads nowhere.

I distrust statistics. It is better to focus on the reality behind them.

Better still is to learn about statistics and avoid such distrust. You need to recognise astrologyism [see 7.7.1994.1]

Astrologers believe they encounter evidence for astrology at every turn. But it is not easy to demonstrate this evidence to the determined doubter.

How can evidence at every turn suddenly become elusive the moment we get serious?

Comment What evidence would Elwell accept as disproving his ideas about astrology? He doesn't tell us. But in a 2001 email to Smit he gave this answer:

(1) If my hands-on experience, virtually on a daily basis, were to start consistently letting me down.

(2) If critics like yourselves produced data and arguments that could not be refuted.

But experience cannot fail, see 4.8, so point (1) is safe. Elwell's one-size-fits-all refutation is "science is not relevant to astrology", so point (2) is safe. When asked for details of a test capable of *confirming* astrology, he gave this answer:

The exhaustive study of a single chart in relation to the biographical data seems to me a valid procedure, provided the interpretations are applied consistently. It is open to critics to draw attention to any infringements of astrological best practice (from his website article #3).

Elwell is saying that researchers should look at charts after the event to see how well the symbolism fits, which of course cannot fail to work. His "best practice" is to not use controls, as if the resulting fatal problems did not exist, and to aim for consistency in interpretation, as if this was a sufficient safeguard against cherry-picking. **Comment** More on this in 7.7.1987.3.

7.7.2002.1 Can science be made more relevant to astrology?

Maarit Lauro. A dialogue between astrology and science. From the CURA website cura.free.fr. She is a Finnish astrologer with a PhD in Education who is looking for areas of science that allow fruitful discussions with astrology.

In 2000 a survey of articles in eight newspapers and science-related magazines in Finland revealed 14 attitudes towards astrology, of which the top 5 with Lauro's response were:

1. Astrologers lack expert knowledge about the zodiac (they know very well which zodiac they use).
2. Scientific research does not support astrology (contradicted by the statistical research of Gunther Sachs).
3. Astrology involves Barnum statements that say nothing (so how can they work with case histories?) .
4. Astrology is based on non-existent physical effects (but can be approached by social science or language).
5. Astrology is an artificial system (such a system might work if it were as old as astrology).

These attitudes suggested to Lauro that to make science more relevant to astrology the focus should be shifted from the natural sciences to other areas of science. This is because:

Astrology is a multidimensional field of knowledge ... a weave of meanings through which explanations for different situations are sought ... the meanings of the self are rebuilt ... a psychological tool for self-knowledge.

In other words she is saying that astrology is not about the physical effects of planets but about symbols whose meaning is different in different contexts. The aim is not to explain something in a physical way but to understand its underlying reality. For example, depending on the situation, the combination of Saturn (cold) and Neptune (sensitivity) could mean:

a house with a mould problem, the dissolving of fears, a change in safety needs, chaos, dimming of the boundaries, gentleness, economic depression, fulfilling of dreams, crushing of dreams, and so on.

which is combined with other chart factors to form a meaningful whole, a starting point for recognising how people are different and how (via transits and progressions) their differences vary over time. In short, science can be made more relevant to astrology, but only if it changes its focus from empirical facts to meaning.

Comment If we restore balance by also asking *how can astrology be made more relevant to science?*, the answer – by changing astrology's focus from meaning to facts – is now entirely reversed. The issue is thus not so much science vs astrology but the fundamental one of facts vs meaning, see 1.5.2. In other words astrology boils down yet again to seeing faces in clouds whose shape conveniently varies with the situation. Apart from being a precarious way to understand reality, is this really a challenge that requires a shift in science?

7.7.2002.2 Is the right concept the key to better results?

Robert Feik, Astrology and Statistics (on asking the right question). *Considerations* 7(4), 68-76, 2002.

Feik argues that probability and statistics are an indispensable everyday tool. However:

The results of astrological investigations have almost invariably been found to be statistically non-significant, inconsistent, or non-replicable. ... many astrologers declare that astrology "does not require proof on rational grounds". [But] why should astrology be uniquely immune to statistical investigation? (p.69).

On the other hand, what could explain the disagreement between, say, Sachs's positive results and Press's negative results for suicide? He suggests they disagreed because no information was provided on the individual circumstances (personal, social, cultural) of each suicide:

Without a conceptual model, there is no guidance as to what to look for (p.71)

If astrology is seen as reflecting not the physical person but the circumstances that shape them, the result is a model that modern research tends not to address. For example, if the circumstances of a suicide are divided into wealth, competitiveness, and aesthetic ideals, each of these three areas will have its own *different* way of minimising suicide risk. This idea:

captures many of the difficulties commonly encountered in statistical studies of astrology including the inconsistency of results, problems with replication, and apparently weak effects. ... it also suggests possible explanations (p.76).

Comment But when the artifacts in Sachs's results are allowed for (see 7.1.1998.1) there is no disagreement with Press's results. In effect Feik is rightly stressing the effect of confounding variables, as when height confounds a person's weight, but as an explanation for inconsistent results it is premature because valid tests have found no evidence for astrological effects.

7.7.2002.3 Pre-requisites for the scientific study of astrology

Joachim Hueg. *Zeitschrift für Anomalistik* 2, 131-137, 2002 followed by six commentaries 2, 138-153, 2002. A serious discussion by academics and astrologers that is too theoretical to be useful. Hueg was then at the JG University Mainz.

Science and astrology share certain basic concepts so that scientific studies of astrology are possible using the general principles of hypothesis formation and falsification. But science and astrology are also sufficiently different that problems can arise. For example science deals in "rational truths" where language is a "controlled message instrument", whereas astrology deals in "symbolic truths" where language conveys "an abundance of content". In effect a scientific study needs to be aware that: **(1)** Causal or acausal hypotheses can be chosen freely. **(2)** The horoscope structure can impose restrictions. **(3)** The human component should be examined empirically with human sciences. **(4)** Chart interpretation should be seen as a mental process in which (2) is free of an external structure while (3) requires an external structure.

Comment Which may leave you none the wiser. Hueg seems to be arguing that astrology is a humanity and thus above scientific rigour, but the same rigour is now present in psychology as opposed to other humanities, so the argument collapses. One commentator pointed out that the implied need for a double methodology will never admit astrology into science, which has a uniform requirement for controls, evaluation, measurement, and so on. In other words astrology must follow the same demands, otherwise its statements will remain incomparable with scientific statements and will thus remain beyond scientific study. But even this seems an unnecessarily complicated way of stating the easy-to-understand arguments of 7.7.1994.1.

7.7.2002.4 Notions of symbolism in the light of science

Suzel Fuzeau-Braesch, *Astrologie Causale ou Esoterique? Les Cahiers du RAMS* 10, 7-13, 2002. Her English version appears in *Correlation* 21(1), 22-29, 2002. Suzel Fuzeau-Braesch DSc (1928-2008) was an insect biologist who became interested in astrology after reading computer horoscopes in the UK that seemed to be amazingly accurate. In 1992 she and others including Françoise Gauquelin and Francis Santoni founded (in Paris) RAMS (L'Association de Recherches en Astrologie par des Méthodes Scientifiques) the first such French association since the long defunct La Société Astrologique de France was founded six decades earlier. *Les Cahiers* was specifically devoted "to research in astrology using scientific methods" in the areas of personality and events. Purely symbolic claims were rejected because "Insofar as the nature of astrological phenomena is concerned, RAMS refuses to consider these as being without natural causes, known or yet to be discovered" (*Manifesto du RAMS* on the RAMS website as updated May 2005).

Many astrologers do not worry about the scientific status of astrology. For them it is merely a technique that works. Other astrologers see science as irrelevant, arguing that astrology is

exclusively a symbolic or spiritual approach, even though the scientific method is the only way of demonstrating the truth of their (factual) claims. They argue that in astrology man and the world are not separated but united by "intersubjectivity", that is, by imaginary connections as when they see the first point of Aries as meaning spring even though in the southern hemisphere it corresponds to autumn. Many other views are just as absurd and fanciful, such as:

a correspondence between world events and the discovery of a planet by astronomers, as if knowledge of it suddenly and magically impacts on the future of human history! ... The moral is thus very simple. All astrological ideas based on symbolism, archetypes, synchronicity, consciousness or cosmic energy are opposed to a simple and scientifically sound astrology. They only fuel attacks by serious opponents (French version p.12).

Comment In short, the future of astrology depends on investigations, open minds, and funding. Which echoes the views of Choisnard a century earlier, who saw how astrology rested on:

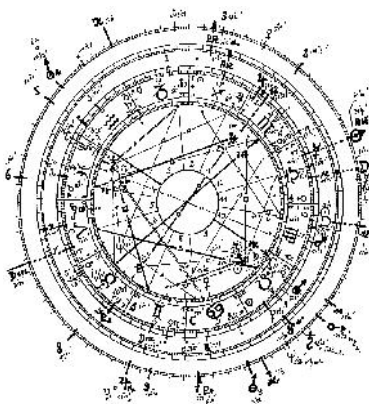
assumptions, analogies, anecdotes [so] only the introduction of statistics and frequencies could settle its problems (de Herbais de Thun, *Synthèse de l'Oeuvre de Paul Choisnard*, 1933-1934:82).

But neither recognised that astrology survives because it seems to work and because it is meaningful. To ignore meaning in favour of statistical investigations is likely to be no more productive than it was a century ago, in the same way that no amount of chimney statistics can be relevant to Santa Claus. Gauquelin's statistics were an advance on Choisnard's, but an advance that ignores the decisive role of hidden persuaders is hardly an advance. Sadly there is little in Fuzeau-Braesch's vision that is of use to researchers or to working astrologers. In effect astrology's big mistake was to seek scientific credibility where none existed.

7.7.2003.1 On being properly scientific

Geoffrey Dean, *Correlation* 21(2), 43-45, 2003.

Everyone might agree with the *Correlation* 21(1) editorial that well-designed studies should do away with erroneous conclusions. But it is hard to agree that current studies in *Correlation* reach this standard. Their conclusions may not be erroneous but they mislead when they assume that confirmation of astrology's reality is only a matter of time. Even *Correlation's* sub-title (research *in* astrology) seems to require it, whereas the original sub-title to 2000 (research *into* astrology) did not, in the same way that we can do research *into* phlogiston but not *in* phlogiston (an idea proposed to explain combustion before oxygen was discovered). If studies are to be relevant they must start from what astrologers actually do under artifact-free conditions, not from what they say they do under who-knows-what conditions. And they must attend to all the evidence, not just the parts selected to prove a case. In short, they must be properly scientific.



Ravi Moon Sukra Ketu	Bodha
Kuja	Late Chief Engineer of a State Chart I Rasi
Guru	Rahu
	Sani
Kuja Sani	Lagna Rahu Moon
	Engineer in Military Service Chart II Rasi
	Sukra
	Guru
	Ketu

Comment So who needs information?

Left: the chart for Mata Hari from *Meridian* 48, 18, 1981 includes progressions and directions.

Right: by comparison these Hindu charts from Rao, *Brihat Jataka* 1957:381, would seem to contain almost no information. But look more closely:

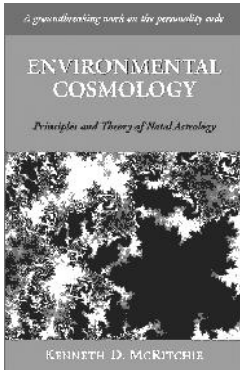
Chart I has Ravi (Sun) and Chandra (Moon) in the same sign, a much better combination than Ravi and Budha (Mercury) in the same sign in Chart II, which explains why the Chief Engineer in Chart I earns five times as much as the Engineer in Chart II. Or so Hindu author B Lakshminarain Rao claims, advising that reading his words will sharpen intellects and expand knowledge (p.vi). But Western astrologers might see such a simplistic reading as ludicrous.

7.7.2004.1 How not to convince academics about astrology

Geoffrey Dean. Book review of Kenneth D McRitchie, *Environmental Cosmology: Principles and Theory of Natal Astrology*, Cognizance Books, Toronto 2004, published online at www.astrology-and-science.com/B-envi2.htm. On his own website McRitchie describes himself as a Canadian poet, technical writer, and astrological researcher.

During his astrological career McRitchie had noticed how astrology could attract hostile

criticism. "It quickly became apparent to me that this attitude against astrology prevailed at all major North American universities" (p.11). He also noticed how one of the problems seen by academics was the lack of a theory to explain how astrology worked. Therefore in 2004 he published this book, which is :



intended to explore only the principles and theory of astrology without hypotheses or testing, which anyone who has appreciated this book and wishes to conduct research is invited to do (p.11).

But presenting ideas that are "without hypotheses or testing" is precisely the approach guaranteed not to interest academics – at least not the ones who value facts before speculations.

McRitchie's first chapter consists of rebutting the various arguments against astrology, not in the normal scientific way by assembling the empirical evidence for and against, or the results of his own controlled tests, but by referring to assumed properties of astrology rather than observed properties, and by making extraordinary (because untrue) statements such as:

Few [matching] tests have been conducted (p. 28). Most of the astrological testing to date has been done by non-astrologers (p. 31). Very little astrological research has been done using accurate charts (p. 31). Personality is not well understood today as a science (p. 32).

On top of all this he aggressively ignores the existence of hidden persuaders.

Then there is scientific name-dropping, which name is then applied to astrology regardless of logic. Examples are McRitchie's reference to fractals (a fractal image is on the book's cover) to support *as above so below*, which implies that symbolism provides the same detail regardless of scale and is thus as applicable to small cats as to world wars; and his casual reference to chaos theory, as in the following statement:

signs, houses, aspects, and planets, are analogous to the structures known as "attractors" in chaos theory ... Because of the sensitive dependency on initial conditions ... a specific interpretation of any of these symbols can potentially spring from a very minute niche within a cluster of meanings ... Without this slight ambiguity of symbolic meanings and the chaotic coherence of the language of astrology, there would be no latitude for the exercise of free will and fate would be predestined (p.53).

Here McRitchie is referring to the *assumed* properties of astrology, not *observed* properties, so how can he know these things? A point made even more awkward by his work being "without hypotheses or testing", so the tiresome business of validation is conveniently unloaded on to others. But chaos theory is still deterministic, so McRitchie seems to be arguing that astrology is also deterministic, which immediately conflicts with its inclining and not compelling. Again, if astrology really were chaotic, then predictions of the kind claimed by astrologers would seem to demand a complete knowledge of initial conditions, which among other things would require impossibly precise birth times. But why would we need to invoke chaos when chance would explain multiple outcomes just as well?

Worse, there are contradictions between McRitchie's supposed critical thinking when he needs to attack criticisms of astrology, and his critical thinking when he needs to justify claims for astrology. For example he dismisses matching tests because:

astrology is concerned with tendencies only, and thus it is not possible to reliably make such specific matches as the astrologers were asked to do. Astrologers should know this and should never agree to participate in such tests (p.29).

But by the same argument, astrologers should never agree to read charts for money. Moreover his dismissal of matching tests conflicts with his later statements such as:

Houses indicate the individual's calling or vocations (p.71). The Gauquelin findings and my own observations tell me that these old astrology texts [where cadent = weak] are simply wrong (p.74). Characteristic urges, feelings and drives can be mapped ... from the collective identities of the planet to the individual (p.87). Events ... are timed by the ongoing movements of the planets (p.102).

But if, as McRitchie claims, it is not possible to make specific matches as in matching tests, it

should also be not possible to make specific statements like those above. Indeed, the book says nothing about how astrology works other than by what the author claims are "five organizing principles" (p.38), which he describes as:

neither theory nor hypothesis but are heuristic descriptions that provide a basis for developing the astrological frames of reference and taxonomy. They are neither true nor false but are paradigmatic presuppositions about the underlying characteristics of nature. They are the starting points for the astrological theories presented later in this book (p.39).

In other words he assumes what he wishes to prove. His five organizing principles reduce to the idea that each individual is the centre of their own cosmic environment, which is natural, cyclic, and has specific propensities associated with specific meanings. The "theories" (for which *as above so below* is the general starting point) then emerge as specific ideas along the lines of chart factor X signifies outcome Y.

To convert these ideas to a theory of astrology he (1) identifies concepts such as "values", "skills", "urges", and "development", (2) casts around for any classification whose numbers happen to be a convenient match to astrology, for example he classifies urges in ten ways whose number just happens to match ten planets, and (3) proceeds from there, thus adding to the already overflowing heap of untested astrological ideas – check any astrology book. Surely a scientific approach requires more than this?

In summary, the book aims to provide academics with a "theory" to explain why astrology works, and promises "an astrology like you have never seen before". But all it provides is speculation and passing the burden of proof, ie astrology as usual, which are precisely not the things to attract any sensible academic. McRitchie's environmental cosmology emerges as no more supported than any other astrology. As a bonus for any academic rash enough to accept interminable speculation, the book's 14-page index is notably free of awkward-for-astrology words like artifact, Barnum effect, confirmation bias, hindsight bias, and meta-analysis.

Comment In 1991 US astrologer-psychotherapist Glenn Perry, one of the most prominent and representative spokespersons of today's psychological school of astrology, approached McRitchie's problem of how to suppress negative evidence by asserting:

astrology was never disproven by the methods of science. Rather, its invalidity was a presupposition. The issue was not one of proof, but of paradigm (*Astrological Journal*, 34 (3), 139-146, 1991).

That is, astrology was presumed by critics to be false in the first place. But in principle the tests made by critics are no different from the tests made by astrologers, which would not be the case if his claim were true; indeed, critics would not have bothered with tests in the first place. Perry is using the fashionable word "paradigm" to hide his wishful thinking.

Furthermore, in the history of science and ideas, theories and paradigms do not have to be disproven to be replaced or superceded. Both Popper and Kuhn (two prominent philosophers of science in the 20th century) were aware that astrology was not disproven. Popper argued that, on the contrary, astrologers go out of their way to develop immunizing strategies to make sure that no evidence will ever seriously threaten their theory. Their one-size-fits-all theories are so elastic that any disconfirming evidence can be quickly explained away. Kuhn argued that practitioners could not learn from failures because they have no reliable methods for determining their causes, for learning from them, and for improving their theories. Instead their approaches are determined only by what is fashionable. They come, they go, regardless.

One telling example is the once fashionable doctrine of sect (see Robert Hand's 1995 book *Night & Day: Planetary Sect in Astrology*) where the planets change their meanings in day and night charts. What works for a day birth fails for a night birth, and vice versa. It implies that on average the world's astrologers must be getting it wrong half the time. Didn't they notice?

7.7.2005.1 House division in polar regions

Michael Wackford, *Correlation* 23(1), 45-64, 2005. Provides the conclusion to his 5-part review of horoscopy in polar regions whose aim was to examine the mathematical viability of house systems, and to establish which systems can be

successfully applied in the polar regions and therefore across the entire planet.

Only Equal, Campanus and Placidus deserve consideration. The first presents difficulties when the circumpolar ascendant reverses. The second pretends that all skies are as witnessed at the equator. Placidus is the only quadrant system (ie one where Ascendant = 1st and MC = 10th) that can be applied in polar regions and still retain astronomical and astrological integrity; but it can still fail to give twelve unambiguous cusps. As for the other quadrant house systems:

Meridian (East Point) – pretends all events occur at the Equator, thus ignoring the real Ascendant.

Regiomontanus – loses eight houses in polar regions, a surprising collapse.

Topocentric – fails to reproduce the semi-arc system by its use of great circles.

Koch – adds five fictitious "birthtimes" for any single event, causing houses to overlap.

Alcabitius – starts with the horizon circle but then replaces it with the Meridian circle.

Porphyrus – starts with the oblique sphere but replaces this with a protractor.

Natural Graduation – starts with the oblique sphere but replaces it with calculus.

Comment But are houses valid in the first place? Is there anything to justify?

7.7.2005.2 The scientific approach is not suited to astrology

Joe Landwehr. The Case for Evolving A Non-Scientific Astrological Research Methodology. *International Astrologer* Winter/Spring 2005. Describes the Case in repetitive detail (here greatly condensed) but not an actual non-scientific methodology other than subjective astrology with no claim to be objective or factual. Thus in his *On the Use of Science To Measure Astrological Theory* he claims that to use astrology "we must depart from the realm of science".

Astrologers are as much a part of a chart reading as the chart itself. They must do more than just "read the chart". They must (1) create a rapport with the client, (2) uncover the client's story, (3) interpret the chart in the context of that story, (4) be aware that the client will receive no benefit unless the interpretation is matched to their needs. This subjective flexible approach is the only effective way that astrologers can work with individual clients. Thus:

The best readings are those marked by intuitive flow ... A scientific approach to astrology presupposes that the symbolism has intrinsic meaning that can be universally applied to all individuals sharing common placements. This is not an effective way to work with individual clients. To require that astrological symbolism be interpreted objectively is to ignore the unique reservoir of subjective wisdom out of which the best interpretations are likely to spring.

In other words the scientific approach lacks the flexibility that is essential if the client's needs are to be met. The astrologer has to choose the interpretation that best suits the situation:

This is borne out by experiments attempting to understand the commonality of those with specific Sun signs or other planetary placements. Such experiments invariably find few statistically valid features attributable to a given placement, because those placements mean nothing taken out of context. ... How then can we suppose that a scientific attempt to objectify astrological information will lead to a more effective astrology?

Comment In effect Landwehr is saying that astrology needs to be meaningful but the interpretation of chart factors does not need to be consistent, because all that matters is how the symbolism of astrology is manipulated for the benefit of the client (ie pick what fits, ignore the rest). But this does not mean that science is automatically excluded. In a complex system like a birth chart the quality of any single factor will always shine through if appropriately treated by statistical inference, which would not be appropriate if astrology existed only in the mind. *But this is not how astrology is generally perceived – not even by Landwehr himself:*

(1) Many astrologers and most clients would not agree that astrology exists purely in the mind and that it does not need to be true, see 4.2. In fact astrologers might lose most of their paying clients if they publicly denied all factual links. But is the client likely to benefit from being told untruths? (2) Science is still needed to help sort out which attributes (of astrologer, of client, of symbolism) maximise not only the benefit but also the nature of the benefit, in the same way that science was needed to sort out the different benefits arising from say Jungian and behavioural therapies. (3) Regardless of whether science is unsuited for testing astrology, it is well suited for testing astrologers and their intuition (or what they call intuition, see 8.9), so far without promising results. (4) Landwehr's comments are applicable to any rich source of symbolism such as the Tarot, so they leave open the important question of which source has

the most potential for providing benefit. For example the Tarot does not require birth data or claimed factual links and is thus arguably more transparent; it is also said to be easier to learn, see 7.2.1986.2. (5) Science continues to evolve in the light of new discoveries, and it discards disconfirmed ideas. Does astrology? Astrology could be held to evolve, but it never discards anything. What his book's title calls a *non-scientific research methodology* is really *creative astrology*, whose examples fill countless forgotten books and magazines. Why attack science when his book's cause would be better served by retreating entirely into the imagination? This would insulate astrology from science and turn “testing” into just personal preference.

Finally Landwehr says nothing about whether his flexible but unscientific approach could in fact have potential for harm, see 10.5, simply because astrology is not counselling. People with problems need to learn coping skills, but this will not happen unless the astrologer is informed about coping skills and is able to pass them on. In such areas appeals to planetary gods regardless of the subjective choice of symbolism may be decidedly less helpful than, say, scores on a relevant psychology test of known validity. Especially as astrologers who promote invalid beliefs do not get off the hook for having good intentions – the wrong thing done for the right reason is still the wrong thing (Wright and Cummings (eds) *Destructive Trends in Mental Health: The Well-Intentioned Path to Harm* 2005).

In other words the issue involves far more than just repeating "the scientific approach is not suited to astrology". But the omissions are hidden under the weight of Landwehr's repetitive discourse. Debate is not helped by presenting incomplete or one-sided views.

7.7.2006.1 Church of Light data tested for 300,000 chart factors

Mark McDonough, *Correlation* 24(1), 34-40, 2006. An interview with Garry Phillipson.

In 1996 US database engineer Mark McDonough met Lois Rodden (1928-2003), which led to them setting up AstroDataBank, with him designing and creating the AstroDataBank program to store and deliver some 30,000 birth data, the world's largest collection of non-Gauquelin timed birth data. Lois Rodden was a dedicated Gauquelin-type collector of data. She devised the now universal system of classifying data reliability (AA, A, B for verifiable sources, C, DD for conflicting or non-verifiable sources). Over 40 years she had collected over 26,000 birth data, adding them to an original collection inherited from the US Church of Light, an unorthodox religion based upon astrology, ESP, induced emotions and directed thinking. It was originally known as the Brotherhood of Light established 1915 in Los Angeles:

Its aim is "to teach, practice, and disseminate The Religion of The Stars". Its practice demands a thorough knowledge of astrology, hence an astrological research section was established by Elbert Benjamin (1882-1951 aka CC Zain) in 1924. It was directed by him until 1951 and then by Doris Chase Doane until 1969 when the research stopped. Over the years it has involved a large, enthusiastic and worldwide band of helpers. Its present name was adopted in order to circumvent anti-astrology laws in the USA. In 2005 it relocated from Los Angeles to Albuquerque NM. In 2015 it celebrated 100 years of Brotherhood of Light lessons. The Church of Light research on events such as accidents, death, marriage, birth of a child, long and short journeys, used at least 100 cases for each event. It found that without exception a progressed major or minor aspect orb 1° existed at the time of the event to the ruler of certain Placidus houses which were usually (but not always) in agreement with tradition. No controls were used. Probability calculations indicate that for their average of about three planets ruling each house, an orb of 1.15° is sufficient to explain the results by chance, or too close to the claimed orb of 1° for the results to mean anything, especially as all charts were prepared by volunteers worldwide in the days before hand calculators (from *Recent Advances* 1977:171 and other sources).

In his interview, McDonough describes how his most earnest interest in astrology began:

at the end of his training as a Marriage and Family therapist. To aid himself in studying astrology, he hand-entered all of the planetary positions of his friends into a database to create sorted lists of planets by sign and house. His logical mind was frustrated by the plethora of conflicting astrological techniques. He longed for a tool that would make it easy to resolve the competing claims made by equally eminent astrologers. He went to ISAR's Computers and Astrology conference in July 1996 to find such software and contact Lois Rodden to pick up some accurate data for doing research. While at the conference he realized that his knowledge of databases and astrology plus access to capital put him in a unique position to make a contribution to the field of astrology. McDonough and Rodden formed a tentative partnership, which became a full-time occupation six months later (p.34).

They called it AstroDataBank. After several years of work he had a computer program that automatically analysed any set of birth data including control groups for 300,000 chart factors, and then reported which factors showed the biggest difference from the controls:

I consider that to be the most comprehensive study of astrology that has ever been done, because no human would have gone through 300,000 factors to see what was different between a control group and an experimental group.

But when applied to actual birth data grouped by say occupation or events, the results if positive (which was not often) failed to replicate. There was no evidence that astrological claims were valid. There were plenty of contradictions, but nothing genuinely worked. He tried the strongest factors grouped together but even then nothing worked:

It was not what you would expect, at all. I went to ISAR's conference ... and I said, "Hey guys ... I'm one of the good guys, that want it to work! But *it's not working*, and I want you to explain that to me". There weren't any satisfactory explanations. Nobody had an explanation for why the standard stuff didn't work. ... I never got over the fact that I got these weird results, and there was no way to explain it. ... Do I think I disproved astrology? No. I have seen far too many amazing coincidences in astrology to believe that it doesn't work (p.36).

McDonough has now left astrology to follow other interests. In 2009 AstroDataBank was sold to the Swiss company AstroDienst AG, who made AstroDataBank birth data freely available via the internet, see 7.3.2018.2. McDonough thinks an explanation for the conflicting results may lie in human intuition that somehow recognizes patterns that computers are unable to see, even when juggling 300,000 factors. But what about when astrologers get right readings from wrong charts? (see 8.9.6). He feels the answer has to be divination, even though in principle it would no longer matter which chart you use:

I would reject that argument – I think most astrologers would reject it as too extreme. ... That's not astrologers' experience – though astrologers do occasionally have great readings with the wrong chart. ... the archetypes are so wide, that the only way you can deal with it is to have strong divination abilities (p.39-40).

Comment But without controls, experience is a completely unreliable guide and certainly not able to judge such complex issues. Note how McDonough seems to want astrology to be both divination and not divination, where no hint of hidden persuaders is allowed to upset the comforting perception of astrological mysteries beyond human comprehension.

7.7.2009.1 Est l'astrologie visible au microscope scientifique?



Suzel Fuzeau-Braesch. *Astrology Off the Beaten Path: A Scientific Study of Planets and Personality* 2009. A summary of nearly forty years of scientifically exploring astrology. Fuzeau-Braesch (1928-2008) had the equivalent of a PhD in insect biology. For 25 years she was a director of research at the Centre National de Recherche Scientifique in Paris. She authored more than 150 scientific publications, was a joint founder in 1992 of the RAMS research group and its journal *Les Cahiers du RAMS* (Recherche en Astrologie par les Méthodes Scientifiques). She concludes that scientists must use their resources to investigate astrology, and gives her vision of an interdisciplinary research centre.

Fuzeau-Braesch's interest in astrology began in 1970 when she was in London for an international biology meeting:

I was walking down Oxford Street, where I discovered the first commercial astrological computer in a little shop. Up until then, I had always felt that an astrologer was nothing but a psychologist with a gift for presenting ideas in an esoteric context. But a computer programmed to produce an automatic astrological analysis? Surely the results must be vague, the same for everyone, I thought. Just for fun, I entered the birth dates of ten of my relatives. To my surprise, the results were quite different from each other. What's more, some of them accurately and uncannily described the people I knew so well.

Back to Paris. One hour in the air was long enough to change a lot of things in my life. I couldn't let go of the astrological printouts of my family members. I had always assumed astrology was useless superstition and trickery. But could there be something in it? I wondered. Here I was, a scientist who has never formed a conclusion without studying, analyzing, and understanding all aspects of a problem, an attitude that I have always considered essential for a scientist. Was I going to back away from this puzzle of astrology? The answer was a definite no. Before I even got off the plane I decided to study astrology with an open mind (pp.15-16). [She was aged 42 at the time]

She read astrology books, took evening classes, and went to one or two astrology conferences:

Everywhere I see that astrology is caught between Scylla and Charybdis; its defenders lack convincing arguments to sway scientists, and, for its adversaries, any means of attack is valid (p.22). [She then quotes the work of Choisnard, Michel Gauquelin, and Suithbert Ertel, plus the Mars effect and other statistical analyses.] Professor Hans Eysenck of London collaborated with astrologers on extraversion and introversion, two aspects of personality. All this work, carried out in England, has been universally studied and universally contested. This, then, is the opinion I formed: that astrology did indeed deserve to be studied but in a perfectly scientific way. And that is what I went on to do with all the means at my disposal, alone at first, then later, with the creation of a research group, the RAMS (p.25).

RAMS (*Recherche en Astrologie par des Méthodes Scientifiques*) was founded in 1992 by the engineer and computer scientist Francis Santoni, Suzel Fuzeau-Braesch, Françoise Gauquelin, and astrologer Yves Lenoble. It saw astrology as a legitimate subject for scientific research, and its aims were to collect existing methods and studies, develop new methods, and publish the results. Although Françoise Gauquelin had helped to found RAMS, she left soon afterwards because she disagreed with its methods and projects. Most of the work published by RAMS is described on its website www.ramsfr.fr, which in 2020 was still operational.

But ultimately RAMS did not survive. Of these astrology research journals, only *Correlation*, founded in 1981 by the UK's Astrological Association, survives today as a journal wholly devoted to scientific research, albeit with sadly



declining standards. In the 1990s *Kosmos*, the journal of the US International Society for Astrological Research founded in 1968, abandoned its already weak devotion to scientific research. *Astrologie in Onderzoek* (AinO) whose precursor was founded by NVWOA in

1977 ceased regular publication in 2003 (but with a final commemorative issue in 2013) due to a lack of positive research studies. *Astro Psychological Problems* (APP), founded in 1982, ceased in 2005 due to the ill health of its editor-publisher Françoise Gauquelin. Similarly *Les Cahiers du RAMS*, founded in 1993, ceased after the death of its editor-publisher Suzel Fuzeau-Braesch in 2008. Clearly astrology's appeal does not come from its scientific truth.

Mistakes made by astrologers

Fuzeau-Braesch summarises the mistakes made by astrologers. They include the claim that astrology can predict the future (if true then most astrologers would be rich), the idea that humans and the universe are one (which is scientifically meaningless), that astrology has no scientific explanation (we must try harder), that astrology involves spiritualism (a juggling of ill-defined terms), their wide use of "energy" (it hides their ignorance) and of symbolism:

It would be advisable to restrict the use of symbols to the way they are used in chemistry, where the symbol is a practical conventional sign or shorthand. Astrology is not "a science of symbols", even though many astrologers, influenced by the impressive amount of esoteric literature that the subject has attracted, treat it as such. [For example] the zodiac is merely a way to describe the position of the Earth in its orbit around the Sun. ... It has nothing to do with the constellations of stars. At the same time this also settles a subject of confusion for a number of astrologers: the problem of the signs of the zodiac for the northern and southern hemispheres. The diameter of the Earth (some 12,700 km) is minuscule compared to the great average distance between the Earth and the Sun (150 million km). Hence every point of the Earth – north, south, pole, or equator – sees the Sun in the same zones indicated by the signs of the zodiac (pp.33-34). [So the idea that signs might change their meaning in the southern hemisphere is absurd.]

Similarly the idea that astrology is a science (no real foundation for this), the idea that planets have no effect until discovered (the root of some serious mistakes), the appeal to synchronicity (a vague and scientifically untested concept), the use of houses (yet another error, see below), and sun sign forecasts (ripe for scientific analysis).

Mistakes made by critics

But critics make their own errors, often with a virulence not expected from educated people. Anti-astrology arguments include precession (irrelevant), negligible gravitational effects (not yet proved), a remarkable ignorance of astrology (but not of tired old mistakes), and the claim that astrology cannot be scientific (just read my book!). She concludes:

It is quickly apparent that the mistakes astrologers make undoubtedly, and most unfortunately, reinforce the positions and mistakes of disbelievers (p.56).

Her experiments

The remaining two-thirds of her book is devoted to her various experiments. Some of them have been completed and are described elsewhere in the present work, namely *cloned cows* 7.2.2009.2, *dogs* 7.6.2007.1, *human sociability* 7.1.1997.2, *sudden infant death syndrome* 7.1.1993.2, *symbolism* 7.7.2002.4, and *twins* 7.6.1992.3.

The rest are works in progress and are generally described without details. They include:

Placidus houses. Preliminary work has revealed no coherent link with personality or events (p.98).

Intelligence. Preliminary work has failed to find a link with birth charts, but certain types of intelligence may be linked to signs, for example speed to Gemini, order to Virgo, depth to Capricorn (p.99).

Demography. The monthly distribution of births in various countries show different maxima (in the northern hemisphere typically in Aries through Virgo) but no conclusions have been made (p.100).

Mundane astrology. Analysis of the (according to André Barbault) astrologically relevant Jupiter-Neptune aspects and (as a control) not relevant Jupiter-Uranus aspects during the reign of Louis XIV found no significant difference in their matches ($p = 0.24$ by chi-squared test). In other words, no valid links with astrology were found.

Stock market. Her work on Western and Eastern stock markets has given conflicting results. She concludes "The influence of astrological phenomena on the stock market seems extremely dubious from a scientific point of view and seems to feed into the commercial desires of authors of books on this subject, as well as those who operate websites on financial astrology. In conclusion, we must state that no scientific causal hypothesis between astrological forces and stock markets can currently be supported" (p.114).

Predictions. Preliminary experiments (which are not described) confirm the validity of transits but not the validity of the numerous other techniques (also not described but which presumably include progressions and directions).

Mars effect. She notes the discrepancy between the angles and the observed emphasis on positions just past the angles, and suggests: "This could perhaps be a consequence of the methodology used, based on the vocations and the qualities inherent in them. This remains to be clarified" (p.123).

How valid is astrology and what to do about it?

Fuzeau-Braesch concludes that her work has shown that some chart factors are valid and can be used with confidence, namely (1) planets at angles and (2) signs. She speculates that the mechanism that could cause these results may lie in the potential sensitivity of DNA dipoles to the geomagnetic field and their effect on human hormones, which in turn have an effect on personality. To support this she cites Percy Seymour's hypothesis of geomagnetic resonances, and quotes the case of a boy born in 2001 extremely prematurely by caesarean section at 31.5 weeks, when the Sun was at 20° Aries, rather than full term at 42 weeks when the Sun would have been at around 20° Gemini. So how did he turn out?

After the child's return home and over the first five years of his life, he appears to have been very energetic, very forceful, and of relatively low sociability, which is completely in character for a birth chart for the true date of birth [ie with the Sun in Aries] ... but certainly not of one for Gemini (pp.148-149).

She concludes that intervention in the birth process makes no difference to the validity of the birth chart. She suggests that it is now necessary to create an interdisciplinary research centre for the scientific study of astrology, for which she estimates that the annual costs might be:

\$ 50,000 for a board of 12 directors.

300,000 for three professional staff (historian, astronomer, scientific astrologer).

200,000 for one lawyer (reason not given).

150,000 for five researchers (one each in astronomy, physics, astrophysics, neuroscience, psychology).

150,000 for two or three computer statisticians.

90,000 for two or three specialists in organising surveys.

100,000 for ten grants to fund outside help.

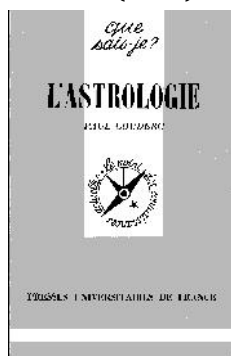
Variable for equipment, animal breeding, projects with universities and observatories (pp.155-156).

Total is well over one million US dollars per year, plus a building providing 20 m² per person, a total of about 1800 m² or roughly nine tennis courts. At the same time:

A health center for the sick will be developed progressively with a number of specialists, a concept [based on her

positive results] that will evolve as the research develops. The cost of this service cannot, however, be estimated at the moment. As specialists, technicians, and other researchers make progress, other health centers will be organized worldwide, covering a wide variety of subjects: children, family and career issues, depression, physical disorders, etc. This will involve collaboration with medical doctors. It will include a "beginners' session room" with very simple images of the sky, the planets, and the Earth projected overhead, with clear and simple explanations [of astrology], the whole experience designed to take place in a comfortable and relaxing atmosphere. That at least is my vision of how things should be. ... because true scientists may – and must! – turn their attention and resources to astrology with an open mind. In this way, astrology will be seen as a "true science" (pp.156-157).

Comment Alas, with few exceptions this brave vision ignores the hundreds of empirical tests made by others whose results tend to contradict Fuzeau-Braesch's positive conclusions such as her conclusion that signs are valid. This might be due to the difficulty in France of obtaining the relevant publications, which are mostly in English (which she was fluent in) and hard to find even in their country of origin, for example see 1.3. On the other hand, in 1989 she authored a new edition of *Que sais-je? L'astrologie* [What do I know? Astrology], one of a famous collection of currently 4000 titles by 2500 authors, each of 128 pages, published by Presses universitaires de France, the world's largest running encyclopedia in paperback format. The first (1951) edition by the astronomer Paul Couderc was described by Jean-Paul Krivine, editor-in-chief of the French journal *Science et Pseudo-Sciences*, as:



an excellent pamphlet, precise, educational, well in the spirit of the collection. It will be reissued and reworked at least five times, proof of its success. [The adjacent picture shows the 6th edition 1978, when 44,000 copies had been sold]

So far so good. But he continued:

Yet in 1989, under the same title, an entirely new book is published, signed Suzel Fuzeau-Braesch. No doubt about the intentions of the publisher. Suzel Fuzeau-Braesch is not an astronomer, she is an astrologer. And instead of a book explaining the astronomical basis of astrology, confronting the latter with science and statistical studies to test its claims, the reader who trusts the famous collection is now in the hands of a pro-astrology advocate, ignoring scientific realities (*Science et Pseudo-Sciences* 272, July-August 2006).

This may be overly critical, but it supports the view that Fuzeau-Braesch's belief in astrology – or at least in the apparent accuracy of those computer printouts forty years previously – was stronger than her claimed need to be properly informed and scientific.

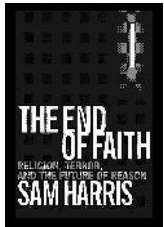


7.7.2009.2 Book review: *Why Astrology is Science*

Tapan Das PhD, *Why astrology is science: Five good reasons* 2009. The Indian-born author is presently living in Canada. He has a doctorate in electronic engineering and has worked in that field for 35 years. His family background created a strong interest and evident belief in astrology, so he was disappointed that astrology was seen as a pseudo-science. After retirement he devoted five years to researching the case for astrology, mainly by reading in libraries. His aim was "to establish a solid scientific explanation for astrology", ie to prove that astrology was a science. He devoted so much time to this that his wife "was wondering whether I had really retired from full-time work"(p.vii).

Most of the book is taken up with uncritical explanations of statistical analysis, social science, alternative medicine, cosmic energies and quantum mechanics (his "five good reasons"), which are then related to astrology. A typical reason for why astrology is a science reduces to something like: astrology involves counting, so does science, therefore astrology is a science. There is no discussion of the characteristics of science (a critical spirit dedicated to eliminating error) and whether they apply to astrology as practiced (they do not). To support astrological claims, the author cites Gauquelin's Mars effect, seasonality of schizophrenia, earthquakes, red hair vs Mars rising, and the Sara Klein PhD thesis on sun sign vs work-related accidents, but that is all. Despite five years spent in libraries, and his belief that "intensive statistical analysis study should be taken to place astrology on a firmer scientific basis" (p.33), he gives no hint that hundreds of such studies exist with consistently negative results. He states "Astrology has not been scientifically shown to be invalid" (p.140), which will be news to anyone familiar

with the literature summarized in the present book. The author provides 60 references mostly without page numbers, all clearly selected to support the case. Gauquelin's 1969/1970 book *Astrology and Science* is cited without any mention of the negative findings for signs, aspects, and transits that fill its chapter 10, yet presumably the author must have read it. There is no index despite his vanity publisher's website stressing its importance. The author proposes that astrologers work closely with social scientists, astronomers, physicists, and practitioners of Alternative Medicine, the aim being to assemble a huge file of birth data and case histories so that the attributes of Sun signs and planets can be regularly updated after analysis (p.145). Astrologers should also monitor the results from The Large Hadron Collider because "newly discovered particles and energies may provide further insight into the relationship between human behaviour and cosmic energies" (p.146). **Comment** In summary, the book is yet another opinionated promotion of astrology as science to the uninformed by the uninformed.



7.7.2010.1 Seeing meaning in clouds of cookery

Sam Harris, *The End of Faith* 2005:287-288. In his exploration of how we suspend reason in favour of faith, US philosopher and neuroscientist Sam Harris gives an example of how even the most unlikely text can be interpreted to give a deeply mystical message that illustrates how "faith works". His unlikely text is a randomly-selected cookery book *A Taste of Hawaii: New Cooking from the Crossroads of the Pacific*. It contains a recipe involving cubed snapper fillet, chopped scallions, salt, pepper, and shrimps, in which recipe Harris sees meaning as follows (the light that this throws on "astrology works" may be as revealing as any of the empirical tests in the present book):

The **snapper fillet**, of course, is the individual himself – you and I – awash in the sea of existence. But here we find it cubed, which is to say that our situation must be remedied in all three dimensions of body, mind, and spirit.

Three teaspoons of **chopped scallions** further partakes of the cubic symmetry, suggesting that that which we need to add to each level of our being by way of antidote comes likewise in equal proportions. The import of the passage is clear: body, mind, and spirit need to be tended to with the same care.

Salt and freshly ground black **pepper**: here we have the perennial invocation of opposites – the white and the black aspects of our nature. Both good and evil must be understood if we would fulfill the recipe for spiritual life. Nothing, after all, can be excluded from human experience (this seems to be a Tantric text). What is more, salt and pepper come in the form of grains, which is to say that our good and bad qualities are born of the tiniest actions. Thus, we are good or evil only by virtue of innumerable moments, which color the stream of our being by force of repetition.

A dash of **cayenne pepper**: clearly, being of such robust color and flavor, this signifies the spiritual influence of an enlightened adept. [But] how large is a dash? Here we must rely upon the wisdom of the universe at large. The teacher himself will know precisely what we need by way of instruction. And it is at just this point in the text that ingredients that bespeak the heat of spiritual endeavor are added to the list – for after a dash of cayenne pepper, we find two teaspoons of chopped fresh ginger and one teaspoon of minced garlic. These form an isosceles trinity of sorts, signifying the two sides of our spiritual nature (male and female) united with the object of our meditations.

Finally **eight shrimps** – peeled, deveined and cubed – [which] of course represent the eight worldly concerns that every spiritual aspirant must decry: fame and shame; loss and gain; pleasure and pain; praise and blame. Each needs to be deveined, peeled and cubed – that is, purged of its power to entrance and misguide us on the path of practice.

Harris concludes that this sort of thing is little more than a literary game:

That such metaphorical acrobatics can be performed on almost any text – and that they are therefore meaningless – should be obvious. [Thus] the occultist can find his magical principles perfectly reflected; the conventional mystic can find his recipe for transcendence; and the totalitarian dogmatist can hear God telling him [what he wants to hear].

Comment And the astrologer can find support for elevating personal meaning above petty factual truth. It is a view that sees astrology and birth charts not as a path to genuine knowledge and reality but as a way of inventing truth – any truth – no questions asked.

7.7.2013.1 Aspects in ten million charts 5000 BC to 5000 AD

Alejandro Barbot, a professor of music at the University of Music in Montevideo Uruguay, and a teacher of astrology since 1999. From www.astrologiaexperimental.com/tag/alejandro-barbot/ first posted (in Spanish) in 2013.

A few years ago I wanted to make a statistical study of planetary aspects in musicians but could find no tool for calculating actual expectancies. So I generated a database of ten million random birth dates over ten thousand years 5000 BC – 5000 AD, a period broad enough to avoid bias due to retrogradation. Taking the aspect frequencies based on uniform motion to be $2 \times \text{orb} / 360$ for 0° and 180° , and twice this for the others (because they are mirror imaged

about the 0–180 axis), and putting actual frequency = uniform frequency x correction, I used my database (orb 5°) to determine the correction for each aspect pair. Here are the results:

----- Correction (blank = no aspect, # = 1.00) -----										
Aspect°	MO	ME	VE	MA	JU	SA	UR	NE	PL	
SO 0	.98	5.22	2.77	1.66	1.19	1.10	1.05	1.03	1.03	
60	1.01		45=5.43	1.40	1.10	1.05	1.03	1.02	1.02	
90	1.02			#	#	#	#	#	#	
120	1.01			.60	.90	.95	.97	.98	.99	
180	.98			.34	.81	.90	.94	.97	.97	
MO 0		.98	.99	#	#	#	#	#	#	
60		1.01	#	#	#	#	#	#	#	
90		1.02	1.01	#	#	#	#	#	#	
120		1.01	1.01	#	#	#	#	#	#	
180		.99	.99	#	#	#	#	#	#	#
ME 0			2.91	1.64	1.19	1.11	1.05	1.04	1.01	
60			1.75	1.37	1.10	1.05	1.03	1.02	#	
120			45=2.22	.63	.91	.95	.98	.98	#	
180				.36	.82	.90	.95	.97	.99	
VE 0				1.59	1.17	1.09	1.04	1.03	1.03	
60				1.30	.98	1.04	1.02	1.01	1.01	
120		For all corrections		.70	.92	.96	.98	.99	.99	
180		in this table the		.41	.84	.91	.95	.97	.98	
MA 0		estimated uncertainty			1.08	1.03	1.01	1.01	#	
60		is less than .01			1.03	1.02	1.01	1.01	#	
120					.98	.98	.99	.99	#	
180		All corrections for			.91	.97	.99	.99	#	#
JU 0		90-degree aspects of				1.01	#	#	#	
60		ME, VE, MA, JU and all				1.01	#	#	#	
120		aspects among SA, UR, NE,				#	#	#	#	
180		PL (not NE-PL) are 1.00				.99	#	#	#	

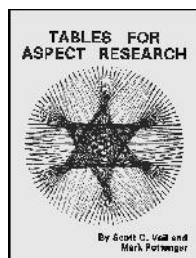
The above table shows the author's original results rounded from three to two decimal places. Actual frequency = uniform frequency x correction where uniform = 2 x orb / 360 for 0° and 180°, and twice this for the others.

Excluding aspects among SO-ME-VE and among SA-UR-NE-PL, the mean correction for all aspects listed above including 90° is 1.000, sd 0.140, N=180. Based on the above corrections, the aspects expected to be most and least generally frequent in charts (expressed as 1 in N charts), which correspond to the highest and lowest corrections respectively, are as follows:

N = 3: SO-45-VE	16: SO-60-JU, ME-60-JU	Least frequent
7: SO-0-ME	17: SO/ME-60-SA, VE-60-JU/SA	40: SO/ME-180-SA
8: ME-45-VE	18: Every square, all 60/120 between	43: VE-180-JU
10: ME-60-VE	MO and UR-PL, MA-60/120-JU/SA	44: ME-180-JU
12: ME-0-VE	19: SO-120-SA, ME-120-SA, VE-120-SA	45: SO-180-JU
13: SO/ME-60-MA,	20: SO-120-JU, ME-120-JU, VE-120-JU	88: VE-180-MA
SO-0-VE	22: SO-0-MA, ME-0-MA	100: ME-180-MA
14: VE-60-MA	23: VE-0-MA	105: SO-180-MA

The author notes that, although corrected expectancies are more accurate than uniform expectancies, they do not correct for effects such as retrogradation that may exist in natal data over a short period. But they provide an unexpected bonus – suppose we have a chart containing both ME-60-VE (1 in 10, sociable) and ME-180-MA (1 in 100, ill-natured) with similar orbs, should we assume the rarer an aspect the more significant it is? In short, other things being equal, are there really ten sociable people for every ill-natured person? He adds "I'm not making any assertions, simply raising the question since I consider it a topic worth investigating".

Lengthy comment The variations in aspect frequencies that occur during short periods during 1900-1999 are illustrated in Vail and Pottenger's 1986 book *Tables for Aspect Research* with additional text by Françoise Gauquelin. The work was sponsored by ISAR and required writing computer programs that calculated the number of days for each angular separation in degrees for each planetary pair, which allowed the expectancy (as a proportion of the total elapsed time) to be calculated



for any aspect and any orb. In principle the resulting tables allowed the calculation of aspect frequencies that applied during the time period of any particular study – provided the distribution of birth data was uniform, or at least uniform during each sub-period. The plots in 7.7.1989.2 show how some variations in angular separation have the expected non-uniformity but with unexpectedly large spikes due to retrogradation. The most extreme variations are those shown by Neptune-Pluto during 1900-1949 (a total of 18202 days) when their angular separation varied from 9° to 59°, with the results tabulated by Vail and Pottenger as follows:

Entries = Duration in days for each angular separation of Neptune-Pluto																
AngSep	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
0	0	0	0	0	0	0	0	0	0	147	173	255	318	278	308	
15*	317	313	254	255	312	324	328	333	327	258	295	336	342	344	347	
30	351	313	327	335	342	348	354	360	364	370	372	375	381	381	387	
45	385	404	444	424	423	483	500	480	516	500	585	576	469	291	198	
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

*For example the 15 line shows the days for NE-PL angular separations of 15+0 degrees to 15+14 degrees.

During 1900-1949 the frequency of NE-60-PL will be too dependent on orb and period to be a reliable basis for research. So to what extent might the same apply to other planetary pairs? Also, despite Vail and Pottenger's ingenious tables, some situations might be too complex for their application. For example UK astrologer Ananda Bagley had observed a seemingly high incidence of harmonic contacts among 50 couples in London when the couples first met (personal communication 1985). Could this be due to chance? The particular contacts were:

Contact 1. One person's 1st, 4th, 7th, 10th, or 13th harmonic UR in 0, 90, 180 or 270° aspect to the other person's 1st, 4th, 7th, 10th, or 13th harmonic SO or MO, orb 2.5°. Here the situation is too complex (because of the many harmonics) to be easily solved with tables, so an exact solution requires computer simulation over the actual time period. But the probability of a contact by uniform motion is easily calculated as shown above that (from Barbot's results) will be a reasonable first approximation.

This is especially true in Bagley's case because aspects 0, 90, 180, and 270 (ie 90 + 180) between two charts are symmetrically distributed around the circle, and an aspect between charts (unlike an aspect within a single chart) can take any value, so any errors will tend to cancel out. The key to calculating probabilities when several aspects are involved is a simple one: probability of a contact = 1 – probability of no contact.

For example, probability of a contact by one of the above four aspects between UR and SO with an orb of 2.5° is $4 \times (2 \times 2.5) / 360 = 1/18$. So the probability of no contact is $1 - 1/18 = 17/18$. In five harmonic charts there are five URs and five SOs, so there are $5 \times 5 = 25$ possible ways in which a contact can occur. So the probability of no contact is $(17/18)^{25} = 0.2396$. The probability of no contact between UR and SO or MO (ie for $1 + 1 = 2$ possible contacts) is then $(.2396)^2 = 0.0574$. So the probability of a contact is $1 - \text{probability of no contact}$, or $1 - 0.0574 = 0.9426$.

Contact 2. In the same charts with same aspects, a contact between VE and SO or MO. Substitute VE for UR in the calculation for Contact 1. The probability of a contact is then the same as before, namely 0.9426.

Contact 3. Ditto between SO or MO and another SO or MO: There are $2 + 2 = 4$ possible contacts, so the probability of no contact is $(\text{probability of no contact})^4 = (0.2396)^4$. The probability of a contact is therefore $1 - \text{probability of no contact} = 1 - (0.2396)^4 = 0.9967$.

Contact 4. Ditto between VE and UR: The probability is $1 - \text{probability of no contact} = 1 - 0.2396 = 0.7604$. The probability of having each of the contacts (1-4) at the same time (if astronomically possible) is $0.9426 \times 0.9426 \times 0.9967 \times 0.7604 = 0.6734$. The probability of having at least one of the contacts (1-4) is therefore $1 - (0.0574 \times 0.0574 \times 0.0033 \times 0.2396) = 0.999997$.



Conclusion. Yes, the calculations are approximate although less approximate than for an individual chart. But even allowing for this, the probabilities are all so high that it seems unlikely that good results would not be obtained even with incompatible and unattracted couples. Chance, not Urania, would be at work. **End of long comment.**

7.7.2014.1 Book review: *Astrology Considered*

Edward Snow (ed), *Astrology Considered: A thinking person's guide*. Published in 2014 by Astrology News Service with funding from the Urania Trust (a UK educational trust created by John Addey), and the Grant Trust (a US educational trust created by AFA founders Catharine and Ernest Grant). ANS is a non-profit organisation sponsored by US astrological bodies including AFA, AFAN, ISAR, NCGR, and OPA. The book's aim is to combat skeptical views and to raise public awareness about astrology and its value. The book consists of 69

short (average 3 pp) articles from ANS archives, of which 46 are by the editor and the rest are by working astrologers. Unusually, from ANS you cannot buy just one copy, you must buy three, two of which are to be given to friends.

The book is divided into three parts. Part 1 *Astrology Considered* has 18 articles saying astrology is not sun signs but a symbolic language for understanding life. Part 2 *The Evidence* has 18 articles suggesting either a grasping at straws (dung beetles working on clear moonless nights use the Milky Way to orient themselves) or serious gaps (sleep researcher found 33 people took an average of five minutes longer to fall asleep at full moon, no references are given) (it was from *Current Biology* 23(15), 1485-1486, 2013 with no mention of the follow-up article in 23(16) uncovering serious artifacts). All without the slightest hint that many tests of astrologers have been made, which would seem to be the only real evidence that might get a genuine thinking person to seriously consider astrology. Part 3 *News and Views* has 33 articles, most of them simple assertions (if astrology is real it means we are not disconnected from the universe, astrologers retain the right to call Pluto a planet) with a few self-evident truths (I believe in astrology because it works, nothing is gained by attacking straw men, both believers and disbelievers are afflicted by confirmation bias).

Comment The editor stresses that the book aims to be readable and persuasive, so anything complicated or technical has been excluded. The result is relentless confirmation bias in favour of just one side of the story. No doubt the editor and sponsors might argue (as John Anthony West does in his 1991 book *The Case for Astrology*) that the aim is to present positive evidence, so negative evidence is of no concern. Which is like a dedicated flat-earther arguing that pictures from space are irrelevant. The drive to promote astrology has led the book's high-profile sponsors to abandon their high-profile ethics in favour of propaganda.



7.7.2014.2 Essentials for scientific research

Aleix Mercadé. Application of the scientific method in astrology [in Spanish], a paper presented at the 31st Iberian Congress of Astrology in 2014. The author is a professional astrologer with Cosmograma, the largest school of astrology in Spain, and a therapist with a philosophy degree from the University of Barcelona. He is the founder of *Astrología Experimental: Hacia una futura nueva ciencia* [Experimental Astrology: Towards a future new science, whose website is <https://astrologiaexperimental.com>] and leads Spain's most active scientific research group in astrology. Here he provides a useful list of what would-be researchers need for good work.

If our results are to be of high quality there are many requirements:

Before starting we should:

- Study the available literature so our research does not appear from scratch.
- Aim at testing a specific hypothesis rather than making a general exploration.
- Be aware that the more general the claim the easier it is to see validity (as in the Barnum effect).
- Be aware that many non-astrological factors (such as age, culture) will usually confuse the issue.
- Make sure we are impartial else we may reject good results just because they contradict our expectations.

Our procedure should:

- Use multivariate methods to analyse many factors at the same time, just as an astrologer does.
- Use control groups, double-blind strategies, and independent replications.
- Make connections easier to find by using representative subjects with the most marked characteristics.
- Exclude subjects who know their birth chart, which makes them potential self-fulfilling prophecies.
- Allow for possible registry errors such as clock errors, misprints, deliberate changes (the 13th), rounding.
- Correct for demographic variations. Some months have more or less births, depending on year and place.
- Correct for astronomical variations, for example the slower the planets the longer they stay in aspect.

Our statistical tests should:

- Recognise that significance alone is misleading (in large samples even trivial effects will be significant).
- Be appropriate (there are lots of tests). It should always measure the magnitude of any effect.

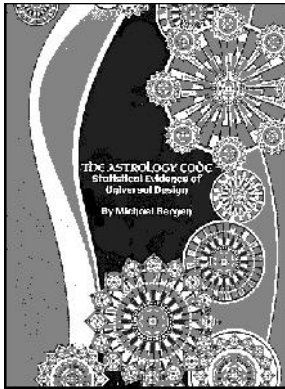
All of this is very challenging. It requires many hours of training, sacrifice and effort that few people can afford. To investigate astrology scientifically without any funding or moral support is nothing short of a miracle. But if the work is shared – something common in the English-speaking world but rare among Hispanics – much can be achieved. Experimental Astrology is

always open to new collaborators.

Comment He could have added two more essential needs. (1) Seek advice before you start to avoid wasted effort. (2) When you are finished and have a draft of your results, circulate them to qualified others for their critical comments. All being well, they will find in minutes the problems you were unable to find in days.

7.7.2014.3 Statistical evidence of inept design

Michael Bergen. *The Astrology Code: Statistical Evidence of Universal Design* 2014. Title echoes Michael Drosnin's *The Bible Code* 1997, which claimed that computer analysis of Bible text – remove spaces and punctuation then examine every *n*th letter forwards or backwards or diagonally starting from anywhere – found words or phrases linked with modern events, but which were later shown by controlled tests using non-religious texts to be an artifact of large numbers, confirmation bias, and ignorance of what was really happening. The same fault has been repeated here, even though web-based reviews by astrologers have described it as "a follow-up to the seminal Gauquelin studies ... required reading ... a book every professional astrologer should have on their bookshelf". See if you agree.



Bergen begins by explaining how at age 22 he was introduced to astrology by a friend and:

knew immediately that my life would revolve around this great field of study. ... I excitedly attempted to analyze the charts of friends and family members. But, I started to notice that the standard techniques in books did not always work so well ... at the time that I ... got engaged then married, I had absolutely no astrological influences in my chart [until in 2005 I looked] at transits to my 9th harmonic chart (pp.1-2).

The results were so convincing that in 2008 he bought a copy of the birth data and full biographies in Lois Rodden's AstroDataBank and sorted it into categories for computer analysis, which took him many months of work. In due course he found many patterns that seemed to be real and statistically significant:

This book is a compilation of those patterns that I found to be effective when interpreting an astrology chart. All together, they form an entire system, which leads to an accurate interpretation of a person or event. The patterns in the 1st harmonic chart show the surface personality of the person, while the patterns in the 9th harmonic chart reveal the person's inner nature. Combined, the detailed dynamics of the person's consciousness are revealed. ... These uses are relevant but inconsequential compared to its real treasure – the revelation that the universe is alive, conscious, and self-willed! The physical universe is the expression or projection of a mind, which precedes it and is, therefore, contained within this mind. We are part of this mind and exist whether in physical bodies or not (p.2).

Even though his study was fully computerised it still took six years to complete.

Method

Bergen analysed the birth charts of 12,566 people covering areas such as:

- Health eg cancer patients, depression, heart attack, infant mortality.
- Occupation eg actors, engineers, journalists, priests, songwriters.
- Problems eg alcoholics, marriage late or never, mentally handicapped.
- Special eg brilliant mind, child prodigy, twins, wealthy.

which he had organised into 80 groups of $N \geq 70$. Many subjects were in more than one group (average two), for example actors with heart attacks would be in both the actor and heart attack groups. The chart factors were diverse – generally tested were planets, signs, harmonics (1st, 9th, 108th), aspects, angularity, midpoints, while occasionally tested were rulerships, element, quality, houses, above/below horizon, transits, progressions, parts, lunar phase, retrogradation, degree areas. The various observed frequencies were compared with two kinds of expectancies: (1) Mean frequency, for example the mean frequency of a planet in signs is $N/12$. (2) Frequency in a control group that has either the same yearly distribution as the 80 groups combined (useful for aspects) or the same time distribution (useful for angularity).

Bergen suggests that expectancy (1) best reflects the way astrology is used by astrologers, where the meaning of planet X by sign/house/aspect is the same regardless of the actual time spent in that sign/house/aspect, and of the proportion of people born with it. Whereas (2):

eliminates the ability to see many astrological effects. We should not be comparing groups of people to the population at large, since the whole population at that time may have an inclination towards certain traits. Rather, we should simply observe if a particular group of people has a disproportionate amount of a given factor (p.6).

Results

Bergen presents his results both by chart factor and by group, generally in detail handsomely presented in tables using boldface type and (non-glossy) coloured type or shading to highlight particular features. The summaries below of his main findings for signs (pp.35-46 and 74) and aspects (pp.51-61) are greatly simplified:

Most frequent		Groups (out of 80) for which $p \leq 0.01$		Suggested new keyword
Sign	occupant	1st harmonic ie natal chart	9th harmonic	
AR	VE	4+ Children	Heart Attack	Adventurer
TA	VE	4+ Children, Singers	--	Natural
GE	MA	Stroke	--	Curious Cat
CN	VE	--	--	Caretaker
LE	MA	Astrologers, Lawyers, Models	--	Ring Leader
VI	MA	Out Of Body/NDE, **	No Children	Non-Virgin
LI	MA	--	--	Wave-Maker
SC	JU	Royalty	--	Underlord
SG	SA	--	--	Explorer
CP	ME	Inheritance, Scientists	--	Mtn Climber
AQ	VE	Comedians, 15+yrs Marriage	Only Child	Socialite
PI	ME	Artists, 80+yrs Long Life	--	Hermit

** Plus Sex Abuse Victims, Sex Offenders, Sex Symbols, Sex Workers.

Groups (out of 80) for which $p \leq 0.01$		
Planet	Strong by aspect	Weak by aspect
S0	--	Politicians
MO	--	Poets
ME	Engineers	Culinary
VE	Child Prodigy	--
MA	29-yrs Short Life	80+yrs Long Life
JU	Obesity, Sex Symbols	--
SA	--	--
UR	--	Politicians
NE	Homicide Victims	Professors
PL	AIDS, Lawyers	Sports
Chiron	--	--

Possibly provocative findings

The traditional meanings for Libra and Aquarius should be reversed.

Virgo the Virgin should be called Virgo the Non-Virgin.

Sun and Pluto are more powerful when unaspected.

Neptune is more about personal power than spirituality.

The fundamental aspects are multiples of 10° (all from p.7).

Tropical zodiac is more accurate than sidereal (p.357).

Of 7 planets $\times 4 = 28$ rulerships, 5 are supported, 7 are contradicted (p.359).

Traditional retrograde effects are supported by Mercury, contradicted by Venus (p.360).

Parallels have no consistent support (p.362).

Perhaps the most provocative finding involved the Ascendant. Bergen notes that traditionally the Ascendant is supposed to show how a person expresses themselves outwardly and is therefore very important. But away from the equator its distribution by sign becomes progressively more and more skewed, peaking in Virgo-Libra in the northern hemisphere and in Pisces-Aries in the southern hemisphere. For example in Moscow at 60° N, 80% of births have Ascendants in 50% of signs (Cancer through Sagittarius, p.351). So he asks:

Is it realistic that human beings would have such a skewed distribution of personality traits? (p.351).

It follows that houses should be looked at with the same suspicion:

If we cannot trust that the sign the Ascendant is in has much importance, how can we have confidence that the sign associated with any subsequent house or house cusp has any value? (p.353).

Comment But why not? People who live in faraway northern places do tend to have more extreme cultures. Despite much effort Bergen's approach is almost entirely subjective and without rigour, nevertheless his conclusions might be of interest to astrologers looking for creative ideas. But for the researcher Bergen's book is virtually worthless. Apart from (1) the relentless focus on signs (the most disconfirmed factor in astrology see 8.3), (2) testing outcomes rather than what astrology predicts, (3) the non-independence of many groups, and (4) the severe problems of using averages as expectancies, there are too many fatal omissions – no sample sizes, no clear examples of statistical calculations, no replications, no effect sizes, no index, and no reference to similar work such as Sachs's *The Astrology File* 1998 and their critiques, let alone *Recent Advances* 1977, which might have prevented most of the problems. No researcher can claim to be serious when he proceeds as if hundreds of relevant scientific studies did not exist, especially when he tells us:

I devoured every book that seemed to offer any insight into the meaning of existence (p.1).

To see how such mistakes make the results virtually worthless, look at the entries in the above tables for which p is said to be ≤ 0.01 . The average number of entries expected by chance per sign, weak aspect, or strong aspect is $0.01 \times 80 = 0.8$, very close to what was actually found (the mean is 0.80), so we have no reason to believe anything special is happening. Look also at the planet that is the most frequent occupant of each sign – it is commonly Venus or Mars, which is what we would predict from their highly non-uniform expectancies. In other words their frequent occurrence has little to do with astrology and much to do with astronomy.

Even worse is the futility of testing without proper safeguards each of 80 groups for around 1000 factors made up of (and this is just for starters):

Signs 252 cases (7 faster planets $\times$ 12 signs $\times$ 3 harmonics).

Aspects 550 cases ($11C2 = 55$ planetary pairs $\times$ 10 aspects).

Angularity 44 cases (11 planets $\times$ 4 angles, planets include Chiron).

Houses 132 cases (11 planets $\times$ 12 houses).

Above/Below Horizon 22 cases (11 planets $\times$ 2 positions).

This makes a total of $80 \times 1000 = 80,000$ tests, for which we can expect $0.001 \times 80000 = 80$ to be significant at the $p=0.001$ level by chance alone. The author does not acknowledge this problem, nor does he tell us the total number of tests, but he does say that there are "over 65 findings" at the $p=0.001$ level (p.368). So right from the start, and with no need to even open his book, we have reason to believe his results are meaningless. Yet Bergen claims:

To my knowledge this is the first project of its kind. Its contents are original and can enhance the way people view astrology, It can also improve the knowledge and accuracy of astrologers (p.1).

All of which is directly contradicted by an earlier controlled computer analysis of the same AstroDataBank data by Mark McDonough (it was just as time-consuming as Bergen's) in which *no finding replicated*, meaning there was no evidence in AstroDataBank data that astrological claims were valid, see 7.7.2003.2.

For the working astrologer this might be bad enough, but Bergen's sheer avalanche of tens of thousands of findings (albeit prettily presented) makes them effectively unworkable – except maybe for astrologers seeking additional clouds (any clouds) in which to see faces.

7.7.2015.1 Professor Peter Roberts 1929-2014

Arthur Mather, *Correlation* 30(1), 9-11, 2015. With added details not in the original. See 9.10 for a picture.

My association with Peter Roberts and the AA goes back to the 1960s. The AA had been formed to focus on research, which had attracted Peter with his MSc in mathematics and BSc

in physics. His first contribution was in *Astrological Journal* 6(4), 23-24, 1964 where he found the overall significance of John Addey's sun harmonics in 7302 UK doctors to be $p = 0.010$, but "This of course is because the harmonics yielding a very high significance level have been *picked out* from 180 possible harmonics [therefore] full confirmation of these levels would require further data" (p.24). In his first *Correlation* article 7(1), 18-25, 1987, his harmonic analysis of Gauquelin's professional groups showed that what seemed to matter was the planet's apparent (visible) position, not its true (corrected for light travel time) position.

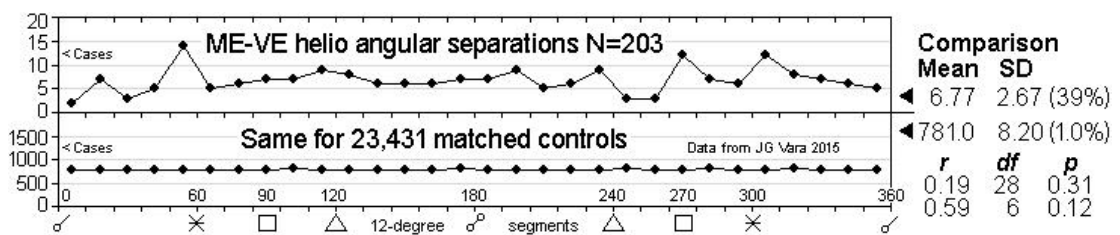
Early on Peter had been the first scientifically qualified person to gain a DFAstroIS. This made him a formidable opponent on both sides of the astrological debate and a valuable contributor to *Recent Advances*. He published two books. In 1990 *The Message of Astrology* introduced his "New Vitalism" hypothesis, the idea that our physical bodies contain a vital spirit, to explain why astrological research had produced so few significant results. It held that only a small proportion of people (he called them *Starborn*) are sensitive to astrological influences. If his hypothesis was correct, it predicted that such people would be famous, would show distinctive diurnal distributions like the Gauquelin professionals, as would strongly similar time twins, and for a famous person the number of famous siblings would be higher than the number of famous non-identical twins. In 1994 he joined with Helen Greengrass to publish *The Astrology of Time Twins*, which included a pioneering study of 128 people born on six selected dates [see 8.7.9]. Both books remain enduring examples of Peter's clarity of thought and writing.

Following his retirement as a visiting Professor in Systems Science at London's City University, he founded a small group to develop an astrological questionnaire for isolating astrological factors in the same way that personality questionnaires isolate personality factors. But without convincing success. Nevertheless his belief in astrology remained unshaken, and he never abandoned the idea that evidence should precede any claims. Indeed as a scientist he was one of the very few AA originals who had a firm grasp of what research required and how it should be presented. He was a key figure during fifty golden years of early UK research.

7.7.2015.2 ME-VE heliocentric aspects for 203 married people

Julián García Vara. Harmonic schemes and experimental outcomes [in Spanish]. The author specialises in harmonics with results given in numerous blogs like the one summarised here, which is from Astrodigitalia.blogspot.com.

My sample of 203 married people was very small, so I divided the aspect span of 360° into 30 segments of 12° each. The 203 cases were born during 1865 to 1970, but were concentrated in particular years, so I created a control group of 23,431 cases whose births were adjusted to match the curve of availability of the 203 married people. Here are the results:



As expected the control plot is very flat because the heliocentric (sun-centred) positions of ME-VE do not have to stay within the maximum geocentric elongations from the Sun of 18° - 28° and 45° - 47° respectively. But the plot for 203 married people shows several peaks that suggest that helio ME-VE aspects are more relevant than their geo aspects (see 7.5.2011.1). Also the separating conjunction at the 0° end is less frequent than the applying one at the 360° end:

From this we cannot draw any conclusion ... but it is still a wake-up call for practitioners of astrology, who would do well to consult their files in search of people who have this angle in their nativities, and review their attitudes.

Comment The peaks in the upper plot show no obvious tendency to coincide with tradition-

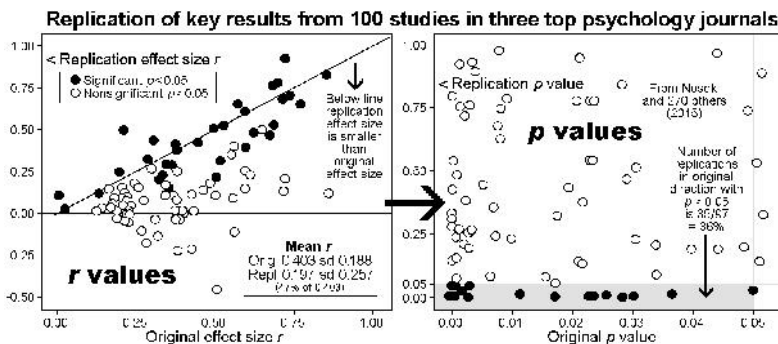
al aspect positions. And the positive correlations (r values, not measured by Vara) show they tend to vary in tune with the controls whether measured over the full 360° ($df=28$) or just at the aspect positions ($df=6$), albeit not significantly, which suggests they are more likely to be an artifact of the distribution of births rather than an astrological link with marriage. But if they are still better than the geocentric results then the latter must surely be indistinguishable from meaningless. Vara's wake-up call might be premature.

7.7.2015.3 Replication tests of 100 key results in psychology

BA Nosek and 270 others, Estimating the reproducibility of psychological science, *Science*, 349, pp 943 and aac4716-1 to aao4716-8, 2015. This paper is one of the most impressive collaborative studies ever made in psychology. Its results have important implications for astrological research and deserve close attention by all researchers.

Debates about evidence are meaningless if the evidence being debated is not reproducible. But how reproducible is reproducible? To find out, these tests began in 2011. During 2008 the top three psychology journals (*Psychological Science*, *Journal of Personality and Social Psychology*, *Journal of Experimental Psychology*) published a total of 488 articles, of which 158 (32%) were selected that had good effect sizes and could be replicated at modest cost. Co-ordinators were able to allocate 111 of these each to its own replicating team with relevant interests, expertise and resources, of which 100 were completed before the two-year deadline. The 111 teams totalled 270 researchers recruited from universities and research institutes around the world.

On average each article contained three studies, of which the first two were frequently pilot studies, so the last was generally selected with its key result as an effect size being the target for replication. Independent reviewers compared the original and replication results, and their analysis was independently checked to ensure accuracy. A replication was successful if the effect size r was in the original direction and its p was <0.05 . Here are the broad results:



Left: How well did effect sizes replicate? Almost all original effect sizes (mean $r = 0.403$) were much larger than those typically observed in astrology ($r < 0.10$). But most of them did not replicate close to their original level (mean $r = 0.197$).

Right: Same, as p values. All original p values were close to <0.05 but only 36% of successful replications in the original direction reached $p < 0.05$.

In addition to the formal assessments, each replication team gave their subjective assessment of "did it replicate?". The results were similar to the formal results (39% yes vs 36% formal).

There was little evidence that differences in success were accounted for by the perceived importance of the effect, by the expertise of the original or replication teams, or by the self-assessed quality of the replication. Nor was it accounted for by low statistical power (ie the probability due to sample size of not missing a real effect), which in the replications averaged an impressive 0.92. In general replication was more successful for:

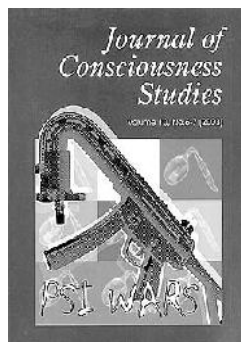
- Main effects than for interaction effects (47% vs 22%).
- Cognitive effects than for social effects (50% vs 25%).
- Larger effect sizes (r for effect size vs achieving replication $p < 0.05$ was 0.304).
- More significant p values (63% for $p < 0.001$, 41% for $p < 0.02$, 24% for $p 0.02-0.05$).

It was less successful for surprising effects and for more challenging studies. Otherwise the generally poor results could have a straightforward explanation, namely:

the possibility that the original studies have inflated effect sizes due to publication, selection, reporting or other biases. In a discipline with low-powered research designs and an emphasis on positive results for publication, effect sizes will be systematically overestimated in the published literature (page aac4716-5).

Comment In general, all the above predictors of poor replication (tiny effect sizes, modest *p* values, surprising effects, challenging studies, low power, publication and other biases) apply to the unreplicated studies in this book, which does not bode well for positive outcomes. Even when an apparently astrological study does replicate (eg self-attribution, Gauquelin planetary effects), the effect sizes are tiny and have a testable non-astrological explanation. Either way, debates about evidence are meaningless if the evidence being debated cannot be replicated.

7.7.2016.1 No reliable evidence against astrological theory?



Kenneth McRitchie, Clearing the Logjam in Astrological Research, *Journal of Consciousness Studies* 23(9-10), 153-179, 2016. A very late response (with the help of Suitbert Ertel and Robert Currey) to Dean and Kelly, Is Astrology Relevant to Consciousness and Psi?, *Journal of Consciousness Studies* 10(6-7), 175-198, 2003 (pictured). In due course Dean and Kelly responded to McRitchie's arguments with "Explaining levitation by denying gravity", *Journal of Consciousness Studies* 24(3-4), 53-67, 2017, also summarised below.

McRitchie condemns Dean and Kelly for their:

closed-mindedness ... evasion of potentially useful evidence, contempt for the astrological corpus, and disdain for peer review (p.176).

His aim is to:

point out weaknesses and errors that [they] should have avoided (p.54),

and to generally discredit the evidence against astrology, which he sees as impeding research and causing a logjam. For example he dismisses their argument that astrology fails to work when hidden persuaders are controlled because they provide "no evidence of this" (p.153, more on this below). Twenty-three pages later the outcome of his re-analysis:

"suggests rather strongly that there is no reliable evidence against astrological theory" (p.175). He concludes "A more open-minded attitude would be to consider that positive astrological findings are simply counter-intuitive, like the countless intriguing observations encountered throughout science. To astrologers who study and use the astrological environment, astrology can be wonderfully counter-intuitive" (p. 176).

Comment Unfortunately (and this is as much a fault of the referees as of McRitchie) his article completely misses the point. McRitchie sees Dean and Kelly's article as an attack on astrology when their aim (as required by a consciousness journal issue devoted to psi) was simply to explore its relevance to consciousness and psi. They start by pointing out that, although astrology has been generally neglected by consciousness and psi researchers,

some astrologers claim that astrology involves an altered state of consciousness, and many more claim that astrology involves some degree of psi. So if astrologers can perform as they claim, we might be on to something (their p.176).

Because consciousness and psi require a living being, Dean and Kelly had to look at the performance of astrologers, not at astrology itself (which was "of little concern"). The connection with consciousness and psi had not been previously explored in depth, so it was worth a try. But after reviewing the relevant empirical studies including their own, which effectively were the studies then corresponding to those of the present 8.6, 8.7 and 8.9, they concluded that:

astrologers who claim to use psychic ability perform no better than those who do not. The possibility that astrology might be relevant to consciousness and psi is not denied, but such influences, if they exist in astrology, would seem to be very weak or very rare (their p.175).

Inexplicably McRitchie mistakes this finding for a direct attack on astrology, so he focuses on astrology rather than the relationship between psi and the performance of astrologers, thus missing the point. Furthermore Dean and Kelly have always stressed that there is more to astrology than being true or false, just as there is more to religion than being true or false, so it made little sense to see their article as an attack on astrology.

That alone would be bad enough, but McRitchie's article is so poorly written that it arguably damages the very astrology it is supposed to be supporting. This was evidently not apparent to the journal's referees so let us look at some of the problems they missed:

McRitchie's conclusion (that there is no reliable evidence against astrological theory) is made *without explaining what that theory is, and without citing a single effect size and hardly any p values*. Instead he accepts astrology as a given, refers to its assumed properties rather than its



observed properties, and supports it not by tests of his own (and certainly not by replicable effect sizes consistent with the claims) but by **(1)** citing five or so empirical studies including Gauquelin's as firm evidence for astrological claims, **(2)** finding fault with a few negative empirical studies, and **(3)** ignoring the verdict of many hundreds of other empirical studies, which in fact he knew of because the first (2016) edition of the present work appears in his references.

Kenneth McRitchie (from his website www.theoryofastrology.com/author/contact.htm).

Which is like finding fault with the fall of apples through gravity (just blame the wind or poor eyesight) to support the idea of levitation. But the problems don't end there:

His claim that Dean and Kelly provide "no evidence" to support the role of hidden persuaders is contradicted by their six examples on their page 181. He condemns them for failing to mention his three "exemplary studies" even though they involved no "practical concerns of consciousness and psi" (p.174), as if ignoring irrelevant studies was inexcusable, and as if incrementing hundreds of effectively negative studies by three allegedly positive ones was enough to change everything. He also follows the example set by astrology's true believers by ignoring two things that are fundamental to the credibility of any research, namely:

1. A result means little unless it replicates and is relevant.
2. Statistical significance is not the same as practical significance.

Re (1), his "exemplary studies" (of red hair, work-related injuries, earthquakes) do not convincingly replicate, see 7.6.1997.1, 7.4.1993.1, 8.8.7 respectively. Nor are they relevant to the usual reasons for consulting an astrologer such as relationship or job problems, or finding lost cats, so they offer no support for the astrology used in consulting rooms.

Re (2), if the sample size is large enough, the relation between any two variables picked at random will *always* give significant *p* values. Even unlikely variables will be significantly if uselessly related, and the null hypothesis will have no chance of surviving, see 7.7.2016.3.

Which may explain why McRitchie, a former astrologer and strong advocate of astrology, and his main helper British professional astrologer Robert Currey, consistently ignore effect size and focus on statistical significance, which suggests that their agenda is driven by nonscientific considerations and is not about to be confused by facts. For more on this see 7.7.2018.1.

As for McRitchie's claim that open minds would see that:

positive astrological findings are simply counter-intuitive, like the countless intriguing observations encountered throughout science,

think of quantum mechanics, which is one of the more well-known and counter-intuitive observations in science. No-one denies the existence of strong replicable evidence for quantum mechanics. And the scientific literature is full of critical evaluations of competing theories. But both features are absent from the astrological literature in general, and from McRitchie's article in particular. If he were to substitute the role of hidden persuaders for what he sees as counter-intuitive he might genuinely advance astrological research and get rid of his logjam.

Lastly, as previously explained in 1.8.2, astrology is like psi in needing a classroom test that would demonstrate its validity on demand. But so far its only controlled classroom test has involved sun sign columns with results never better than chance, which to most astrologers will be no surprise. Nevertheless *until there is a successful classroom test, any campaign like McRitchie's to validate astrology as a source of knowledge will be a waste of time.*

Urgently needed here are controlled tests that replicate and show positive effect sizes com-

mensurate with astrological claims. Such tests would in principle blow the skeptics away forever, and astrology would at last be secure against attack.

So why doesn't McRitchie just get on with it and produce such tests? According to him, the truth of astrology is quickly apparent to anyone who cares to look with an open mind. So how hard can it be? By now, after 2000 years of shouting matches between astrologers and critics, the answer should be glaringly obvious – *he does not produce such tests because he is unable to*. Ironically this point is supported by his own book *Environmental Cosmology* that was "intended to explore ... astrology without ... testing" see 7.7.2004.1. Excuses yes. Obfuscations yes. But actual tests? Of course not. Why have tests when you can have arguments?

7.7.2016.2 Two approaches for testing Mercury retrograde

Aurora Murgea. Mercury retrograde in capital markets: Truth or Illusion? *Timisoara Journal of Economics and Business*, 9(1), 49-61, 2016 (Timisoara is a university town in Romania). Renay Oshop, Non-dictionary words in Amazon reviews occur more during Mercury retrograde. Kepler conference 2017 and www.ayuraastro.com/

Murgea notes that studies of weather, seasonal and geomagnetic factors vs financial markets have found small but consistent effects explainable in psychological terms such as depression, anxiety and risk aversion, but similar studies involving the moon and astrological factors have tended to give mixed results compounded by expectancy and self-fulfilling prophecy effects (people act according to beliefs regardless of whether those beliefs are true). So she decided to test for abnormal behaviour in the US capital market during Mercury retrograde periods to see if an astrological explanation could fit the empirical results. She comments:

The [US] market has been chosen considering two very important factors. On the one side, USA capital market is one of the most efficient capital markets and in theory [a retrograde effect] should be less present [sic], but on the other side the financial astrology field is more developed there than in any other part of the world. These two arguments make USA a very good case for our study (p.55).

The input data were the daily closing indexes from 1 February 1993 to 31 December 2012 (just over 5000 working days and 60 retrograde periods) for the Dow Jones Industrial Average (price-weighted average of 30 large publicly-owned US companies and the most well-known share index in the USA) and the Standard & Poor's 500 (weighted index of the 500 largest US companies by market value), tested in a regression analysis of the form

$$\text{volatility} = A + Bx + \text{optional sum of } Cx \text{ for previous 1-3 days} + Dy$$

where $x = (\text{closing index} - \text{closing index on previous day}) / \text{closing index on previous day}$
 volatility = daily change in closing index (ie x for today – x for yesterday)

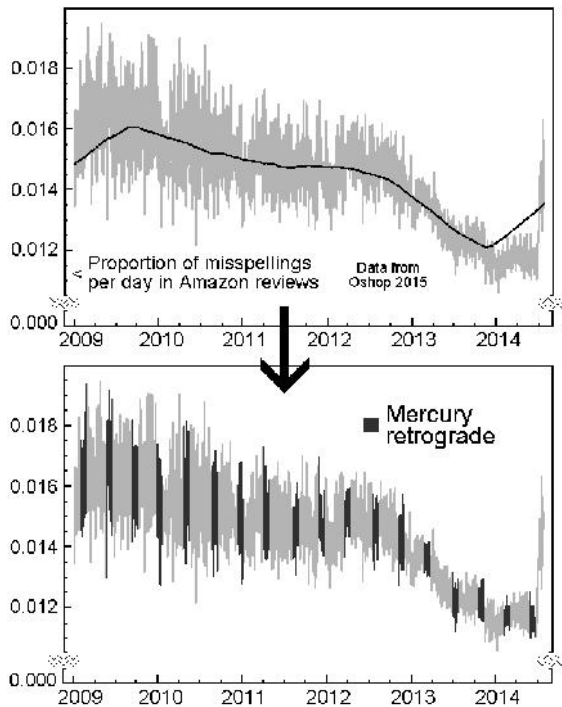
A,B,C,D = empirical coefficients (C allows the option to include past differences)

$y = 1$ if Mercury is retrograde, otherwise $y = 0$.

Typical values for both the Dow Jones and S&P were $A = 0.00035$, $B = -1.05$, $C = 0.2$ to 0.5 , $D = -0.0004$.

For both indexes the results were statistically significant, and showed that volatility was *weaker* during Mercury retrograde periods, which is the opposite of what astrology predicts. The dependency increased as more past differences were included (ie volatility was better explained by a longer volatilities history). The author sees this as confirming a *belief in strong volatility* during Mercury retrograde, which is evidently invalid; but if it persuades believers to be cautious in their trading it will reduce volatility in agreement with the empirical finding.

Oshop adopts a very different approach in her test of abnormal behaviour in Amazon reviews during Mercury retrograde periods. The input data was a 5% sample picked at random from 82 million Amazon product reviews free of duplicates posted between 1 Jan 2009 and 23 July 2014, just over 2000 days and 18 retrograde periods. The idea was to count the proportion of words each day that were not in a computerised dictionary, excluding digits, internet links, emoji (smileys), words of three or fewer characters, non-English words, capitalisation mistakes, and the 16% of reviews not in the main format of the database (this was needed for analysis). If the word was not in the dictionary, it was counted as a misspelling.



Oshop expresses the total misspellings for each day as a proportion of the total words for that day and plots the results against date as shown in the upper plot. She then subtracts the moving average (shown as a dark line) and submits the results to Fourier analysis to determine the frequencies present. There was a huge number of frequencies, all with amplitudes less than 0.003 (ie less than 10% of the original proportions), of which the two strongest (by a small margin) corresponded to Mercury retrograde and its first harmonic, which Oshop then sees as an important first step in demonstrating the reality of a retrograde effect.

Comment Unfortunately the use of a moving average will both add and subtract frequencies, so the Fourier analysis of filtered data will create artifacts right from the start. And Fourier analysis is hardly needed. If the retrograde periods are highlighted as in the lower plot, we can immediately see whether Mercury retrograde coincides with more misspellings and whether it replicates (if the answer is visually difficult to decide then *t*-tests of the original data will tell us what we need to know).

There are further problems. The Amazon reviews cover all possible subjects, so why should a word not in the dictionary count as a *careless misspelling* when it could well be due to *careful spelling* of a word that is unlikely to be in a dictionary? What about English vs American spelling? What about weekend and seasonal effects? Why does the data in the second half plunge in favour of fewer misspellings by about 0.004, or more than the highest amplitudes claimed to be due to Mercury retrograde?

More importantly, as in Murgea's findings, what proportion of reviewers might have known about Mercury retrograde and timed their review writing accordingly? How do we know the effect (whatever it is) has not contaminated other years? A harmonic of the retrograde period would seem to implicate occasions when Mercury is not retrograde, so how can this make sense? And if only 5% of the original data was used, why are there no replications?

Unlike Murgea, Oshop presents no survey of the literature, which in principle is not how any research claiming to be scientific should be done. In this case the use of Big Data might seem to create more problems than it might solve due to the difficulty of knowing what confounding data it might contain. Compare Oshop's approach with that of UK astrologer Gill Lerner, who in a 2001 talk to the Astrological Lodge of London described a simple experiment showing how Mercury retrograde was a self-fulfilling prophecy:

A little experiment in the office shows what happens when you know there is a retrograde Mercury about, and when you don't. Forewarned but are you forewarned? (from the Lodge programme flyer for Spring 2001).

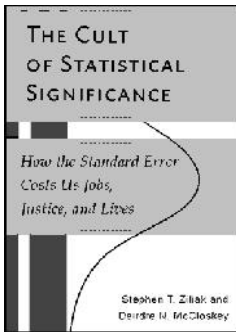
Murgea of course reached the same conclusion. In other words, like sun sign self-attribution, knowledge of Mercury retrograde is a case of *priming*, where simple expectation leads to self-fulfilling behaviour and the seeing of things that are not there.

7.7.2016.3 Why *p* values can lead to wrong conclusions

The whole area of *p* values, probability and statistics is notorious for being hated by non-science university students because the concepts and jargon leave them baffled and confused. Non-technical readers of this book may well know the feeling. A *p* (or *P*-) value is a measure of the probability from 0 (zero) to 1 (certain) that the observed effect is true if there was no effect, loosely interpreted as the probability of getting the result by chance. If *p* is small enough to make chance unlikely, the result is said to be *statistically significant*, an approach popularised by the British statistician Ronald Fisher in the 1920s. Today, despite much criticism, *p* values play a major role in research. Thus most astrology

researchers (and until recently most medical and psychology researchers) see no result as worth having unless $p \leq 0.05$ or, even better, ≤ 0.01 , which levels were set arbitrarily by Fisher to facilitate calculation of reference tables. But their popularity has been a disaster for progress. What follows is directly relevant to every empirical study in this book

The **outmoded** view points out that p values ≤ 0.05 yes/no are an accepted tradition and are therefore a trusted part of research. The **modern** view says p values have caused a flood of incorrect scientific conclusions and should be banned. Indeed statisticians have for decades focussed on the shortcomings of p values (eg Shrout et al, American Psychological Association Symposium, *Psychological Science* 8(1), 1-19, 1997), but with almost no effect until recently because yes/no conclusions based on p values are *just too convenient*. In 2015 US professor of journalism Charles Seife summed up the modern consensus view of a p value like this:

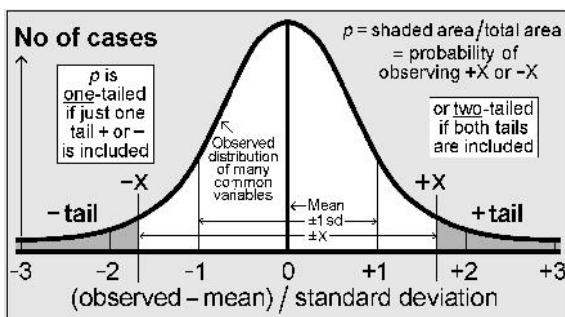


It's a boon for the mediocre, the credulous, the dishonest, and the merely incompetent. It turns a meaningless result into something publishable, transforms a waste of time and effort into the raw fuel of scientific careers. It was designed to help researchers distinguish a real effect from a statistical fluke, but it has become a quantitative justification for dressing nonsense up in the mantle of respectability. And it's the single biggest reason that most of the scientific and medical literature isn't worth the paper it's written on (in John Brockman, *This Idea Must Die* 2015:519).

If it seems incomprehensible how something so widely used could be so worthless you can turn to countless papers and at least a dozen books on the subject, of which that by US economists Ziliak and McCloskey (*The Cult of Statistical Significance* 2008) is especially relevant because economists use p values as blindly and as wrongly as do astrologers. (Psychologists and medical researchers have been only slightly better.)

About p values

Suppose you want to test the idea that Leos are generous. It is early August, so you observe birthday celebrations in restaurants and find that 15 out of 20 Leos give big tips. This is so obviously better than the $20/2 = 10$ expected by chance that it looks like a winner. But wait. In effect you are trying to judge two hypotheses. The first, called the *null hypothesis* (Leos are not generous), is that 15 is no better than the $20/2=10$ expected if the hypothesis were true. The second, called the *alternate hypothesis* (Leos are generous), is that 15 really is better than 10. The difference may seem obvious but chance is a tricky thing, which is where a p value come in. It tells you how unlikely 15 would be if big tips were unrelated to being a Leo.



This plot is technical and can be skipped if needed. The calculation of p depends on how the observations are distributed when spread out. They might be concentrated at one end, spread uniformly, or humped in the middle. The last (pictured) is called a *normal distribution* and applies to most (not all) variables in nature such as the height of men, the weight of cows and the length of individual carrots. The p values are given by the proportion (shaded area / total area) under the curve. Plotting the quantity shown on the horizontal axis conveniently reduces every mean to 0 and sd to 1, which is called *standardisation*. The fit to normality can vary but a central hump is usually good enough.

The accepted dividing line is $p \leq 0.05$. So $p > 0.05$ means nothing special is happening, but not $p \leq 0.05$. In this case $p = 0.03$. Your fame on the pages of *Correlation* seems assured. Except:

A p value does not tell you what you want to know

You want to know whether or not your data support the idea that Leos are generous. But a p value is the probability of your data given the *null hypothesis* (Leos are not generous), not the probability of Leos being generous (the *alternate hypothesis*) given your data (you observed big tips). Dutch psychologists Wagenmakers et al, *Journal of Personality and Social Psychology* 100(3), 426-432, 2011, explain why the two probabilities are not the same thing:

the probability of someone being dead given that he was lynched (a probability that is close to 1) is confused with the probability that someone was lynched given that he is dead (a probability that is close to zero) ($p.428$).

In the case of Leos being generous:

What you want to know is: the probability of **big tips** given **Leo** (the *alternate* hypothesis).

But a *p* value tells you only: the probability of **Leo** given **big tips** (the *null* hypothesis).

Which is not helpful when other causes for big tips may exist besides being Leo such as being rich or drunk.

So try again. To properly evaluate the evidence provided by your data for or against the idea that Leos are generous, you need to pit the null hypothesis of *no effect* (Leos are not generous) against the alternate hypothesis of *effect* (Leos are generous). But *p* values don't do this.

Two statistical pioneers. **Left:** Sir Ronald Fisher FRS, 1890-1962, whose ground-breaking work revolutionised the design of experiments and developed the mathematical theory of statistics and its applications – especially to agriculture – including many concepts such as variance and maximum likelihood, and many tests such as *p* tests, *F* tests, and the Fisher exact test. An undoubted genius, he had a massive ego, a quick temper, and was seemingly incapable of admitting he was ever wrong, especially in public. **Right:**



William Sealy Gossett 1876-1937, head experimental brewer at Guinness who developed new statistical methods for both brewery and farm including the *t*-test and correction for small samples ($t = z/\sqrt{N-1}$), statistical significance, design of experiments, Monte Carlo methods (simulation with random numbers), quality control, agricultural economics, and econometrics. He was a model of niceness and was seemingly incapable of saying an unkind word about anyone, even when Fisher adopted some of his methods as his own. As the famous British statistician Egon Pearson (son of the equally famous British statistician Karl Pearson) said of Gossett, he

worked "not for the making of personal reputation, but because he felt a job wanted doing and was therefore worth doing well" (Ziliak and McCloskey 2008:21). Whereas Fisher focussed on significance, Gossett focussed on oomph because he needed to say to farmers "if you do this you will make money", not "you will do better than chance")

Ziliak and McCloskey put the difference between the Fisher and Gossett approaches like this:

If you yourself deal in medicine or psychiatry or experimental psychology [to which some might add astrology], Gossett and we would recommend that you focus on *clinical* significance [ie effect size or what they call oomph, p.6]. In short, Gossett's rule is: in any science, attend to oomph. An arbitrary and Fisherian notion of "statistical" significance should never occupy the center of scientific judgement. [Gossett said] "a merely statistical significance defined in Fisher's way seems to me to be nearly valueless in itself" (p.20). [Their book details the resulting clashes]

Why *p* values have caused a flood of incorrect scientific conclusions

p values look only at the hypothesis of *no effect* and ignore the hypothesis of *effect*, which is why they can give incorrect conclusions. Also, when conclusions are related to the traditional yes/no of $p = 0.05$, there is the recognised absurdity of declaring $p = 0.049$ as significant and $p = 0.051$ as non-significant. Or as US statisticians Rosenthal and DiMatteo put it:

If our dissertation p is $< .05$, it means joy, a doctorate, and a tenure-track position at a major university. If our $p > .05$, it means ruin, despair, and our advisor suddenly thinking of a new control condition that should be run. That attitude is not helpful (in Pashler & Wixted eds, *Stevens' Handbook of Experimental Psychology* 3rd edition 2002:397).

The eminent US psychologist Paul Meehl is more forthright:

I believe that the almost universal reliance on merely refuting the null hypothesis as the standard method for corroborating substantive theories in the soft areas is a terrible mistake, is basically unsound, poor scientific strategy, and one of the worst things that ever happened in the history of psychology (*Psychological Reports* 46(4), 806-834, 1978:817).

And that is just in psychology. In medical research the situation is just as bad:

There is increasing concern that in modern [medical] research, false findings may be the majority, or even the vast majority of published research claims. ... Research is not most appropriately represented and summarised by *p*-values, but, unfortunately, there is a widespread notion that medical research articles should be interpreted only on *p*-values (John Ioannidis, Why Most Published Research Findings Are False, *PLoS Medicine* 2(8), 696-701, 2005:696).

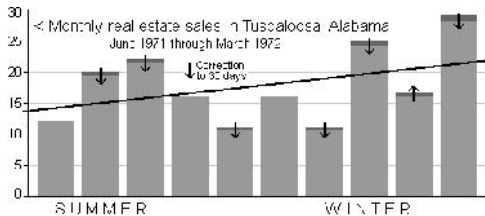
Or as eminent US statistician Jacob Cohen puts it:

The ritual dichotomous reject-accept decision, however objective and administratively convenient, is not the way any science is done (*American Psychologist* 49, 97-103, 1994).

Indeed, the popularity of *p* values leads to less than 40% of key results in psychology failing to replicate (see 7.7.2015.3). To which you can add what is known as *p-hacking*: US information scientists Bergstrom and West (*Calling Bullshit: The Art of Scepticism in a Data-Driven World* 2020) note that negative results are not newsworthy, so you need an appropriate strategy:

Imagine that you have just spent months collecting a massive data set. You test your main hypothesis and end up with results that are promising – but non-significant. You know you won't be able to publish your work in a good journal this way, and you may not be able to publish it at all. ... So you keep collecting data until your p -value drops below 0.05, and then stop right away lest it drift back above that threshold ... Or maybe you try a few other statistical tests. ... Or maybe your hypothesis [is] correct only for men ... What are you going to do? Scrap the whole project, abandon thousands of dollars invested, ask your graduate student to delay her graduation by another six months ... or just write up the result for men and submit to a top journal? ... Congratulations. You've just p -hacked your study (pp.221-223).

For example US astrologer JM Wellser had bought and sold three houses, the two quickest being near the time of a New Moon, which led her to the idea that "some sort of cosmic force was involved" (*Dell Horoscope* 61(8), 38-39, 1973:39). So she looked at the 178 house sales in Tuscaloosa AL Jun 1971 – Mar 1972 for differences on the dates of New and Full Moon, the same dates $\pm N$ days (where $N = 1, 2$, and 7), and their quarter-plus-previous-quarter dates.



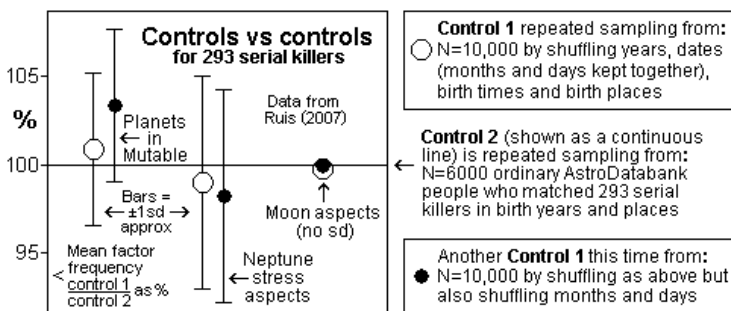
Of her five tests, the only dates to give significant results were those for $N=1$, with a total of 20 sales in the New Moon period vs 9 in the Full Moon period ($p = 0.03$ by a t -test between monthly means), so "it can be concluded that the New Moon does affect the sale of real estate" (p.40). But among five tests the actual p is more like $5 \times 0.03 = 0.15$, so her conclusion is unwarranted unless confirmed by independent replication. Her result indicated only an area possibly deserving more study.

Even the proper use of controls in astrology does not avoid the above concerns because:

Controls may not control what needs to be controlled

You cannot *safely* conclude that chart factor X is responsible for your $p \leq 0.05$ because you cannot be sure your sample is free of artifacts that mimic astrology and thus evade your controls. Examples are self-attribution in tests of sun signs, selection bias in Jung's marriage experiment, sampling error in Vernon Clark matching tests, and misreporting in Gauquelin's planetary studies. But shuffling or interchanging the subjects birth data (a trick generally used to control artifacts) will not work because it cannot differentiate between astrology and artifacts that mimic astrology, just as shuffling cards changes their order but not which ones are jokers. This means it is essential to have controls in which artifacts are known to be absent.

Another complication. Less than a minute of birth time is enough to change a house position or Ascending sign, even though births are rarely timed so precisely. So how good is shuffling at providing controls at this fine-grained level? Some hints are provided by Dutch astrologer Jan Ruis in his comparison of three controls for 293 white male serial killers in *Correlation* 25(2), 7-44, 2007. Each control was meticulously prepared, and each on its own might well be considered an acceptable control, yet their differences were statistically very significant – differences that reflect their different approaches and their different shuffles of different demographics. Here are the control results from his Tables 10, 12, and 14:



Means for Controls 1,2,3 (look at the circles) are within a few % of each other and the ± 1 sd bars overlap, suggesting good agreement. But by t -test the first open circle for Control 1 differs significantly from Control 2 ($p = 0.003$), and the open and closed circles for Neptune stress aspects also differ significantly ($p = 0.00001$). The controls are thus significantly unlike, so what are they controlling? (Ruis gives sds only for Control 2, so the rest are assumed to be similar).

Question: is any chosen control actually shuffling the right demographics or is it creating artifacts by shuffling the wrong demographics? The area that deserves more research. It is all too easy to see astrology in every apparently non-chance effect that in reality could be due to uncontrollable artifacts such as self-attribution, which is especially important because:

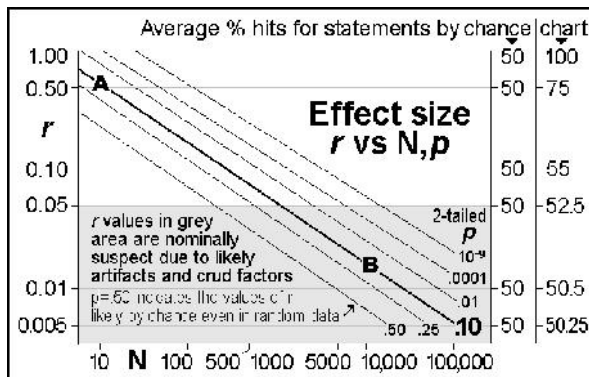
Self-attribution is potentially everywhere

Astrology is so popular and so widely studied that self-attribution (role-playing our chart) is a plausible artifact in any dataset. We cannot be sure which chart factors will be mimicked but we can be sure that shuffling will not distinguish astrology from mimic since both are locked in the data. Increasing N will not change the proportion of artifacts but it will inflate their statistical significance (see next), which makes the result open to misinterpretation as "clear statistical confirmation" of astrological effects (loud cheers from believers in p values).

In other words artifacts are hidden persuaders waiting with p values to lead us unknowingly to seriously wrong conclusions. But the bad news about p values doesn't end there:

A p value by itself tells us nothing useful

Although p values are determined by effect size and sample size, they cannot tell how big the effect is. They indicate only statistical significance not practical importance, ie effect size. The way effect size varies with N and p shows how easily p values can lead to wrong conclusions:



At A, a sample $N=10$ returns $p=0.1$ for an effect size of $r=0.50$, equivalent to 75% hits in a reading when chance is 50%, – useful but barely significant.

At B, $N=10,000$ also returns $p=0.1$ for an effect size of $r=0.02$, equivalent to a useless 51% hits when chance is 50% hits. The 0.1 p 's cannot decide between being useful at A and useless at B.

This plot can be used to estimate effect size when only N and p are available. But unless the result is clearly more than the effect size due to typical artifacts in similar data as indicated by the grey area, we cannot conclude it may be due to astrology until confirmed by artifact-free replications. Examples of artifacts are given above under Controls.

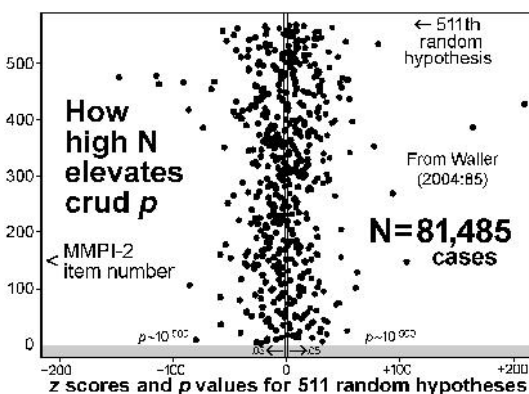
There are many other problems with p values other than their failure to indicate oomph:

The null hypothesis of no effect is always false

Human data always contains tiny correlations that a large enough N will inflate to any p level we like. So increasing our sample size will *always* work (ie give significant p values ≤ 0.05) even if none of our chart factors actually work. These tiny correlations are not necessarily just those due to chance. Paul Meehl (we met him earlier) puts it like this:

in psychology and sociology everything correlates with everything. Any measured trait or attribute is some function of a list of partly known and mostly unknown causal factors in the genes and life history of the individual, and both genetic and environmental factors are known from tons of empirical research to be themselves correlated. ... taken literally, the null hypothesis [ie of no effects] is always false (*Psychological Reports* 66, 195-244, 1990:204-205).

In which case we should routinely see chance results as never actually zero but always sufficiently non-zero to match what Meehl calls the "ambient correlational noise" or "crud factor", even though its value will be unknown in any particular case.



An interesting test of Meehl's crud factor was made by Waller, *Applied & Preventative Psychology* 11, 83-86, 2004, using 81,485 responses (41,491 male and 39,994 female) to 511 items known to be unrelated to gender from the MMPI-2 personality inventory. Each of the 511 items (whose content varied widely over health, habits, interests, family, and personality, think of astrology) was randomly assigned a link yes/no with gender (ie a link known not to exist) and was then tested against the responses to give a p value via its observed z score. As Meehl predicted, the huge sample size inflated the links (which were essentially noise) to an impressively high significance level. Almost every result here lies well beyond the $p=0.05$ levels shown by the two parallel lines in the centre of the plot, and some even exceed $p=10^{-500}$. All are noise yet almost all on the right are nominally "significantly positive results".

Therefore one way to find links in astrology that do not actually exist is to use huge samples, and of course to never replicate in case replication should fail (ie a sort of publication bias). But back to the problems of p values. Various solutions have been proposed:

Proposed solutions to the problem of p values

(1) US statisticians Berger and Sellke suggest an approximation that is easy to apply (*Journal of the American Statistical Association* 82, 112-122, 1987). For a more realistic p value, simply use $z-1$ or $t-1$ in place of z or Student's t . For example when $z = 1.96$ ($p = 0.05$), a more realistic p is given by $z = 0.96$ ($p = 0.34$). When $z = 3.29$ ($p = 0.001$), a more realistic z is 2.29 ($p = 0.02$). To get a realistic p of 0.05 the normal p has to be around 0.003.

(2) UK mathematician Robert Matthews (*Journal of Scientific Exploration* 13(1), 1-7, 1999) shows that if we have a z value from our test, where z is a common statistical measure given by (observed – mean)/sd, and have no opinion either way about the outcome, the minimum probability that our result is a fluke is given by $1 / (1 + e^x)$, where $x = z^2/2$. For example, if $z = 1.96$ (which corresponds to ordinary $p = 0.05$), and $x = 1.921$ say, then:

$$\text{minimum probability} = 1/(1+e^x) = 1/(1+e^{1.921}) = 1/7.83 = 0.13$$

We may have achieved ordinary $p = 0.05$, but the minimum probability of our result being a fluke is 0.13 and could well be more, which of course is less convincing than $p = 0.05$.

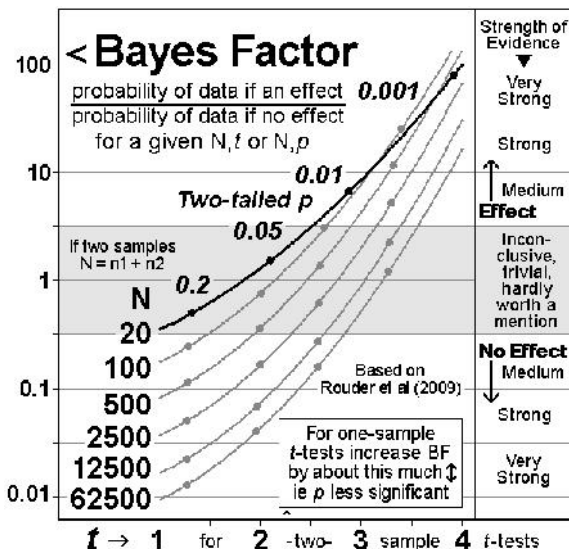
Both the above solutions are based on tinkering with p and have not been widely adopted. In principle a better solution is to directly address the effect of the alternate hypothesis:

Fixing the p -value problem the Bayes Factor way

The challenge is to consider both the null and alternate hypotheses at the same time, which is precisely what p values can't do, and never have done. So we have to say goodbye to mushy p s in favour of something that does the job. One good way is described by US psychologists Rouder et al, (Bayesian t tests for accepting and rejecting the null hypothesis, *Psychonomic Bulletin & Review* 16(2), 225-237, 2009). As when t -testing the difference between two means in the usual way, you input t and N , but instead of getting a p value we get what is known as a Bayes Factor, a number that indicates the extent to which *no effect* or *effect* is better supported by our data. It tells us what we want to know.

The method is mathematically challenging but easy to use via a web-based program that does the calculations for free. Go to <http://pc1.missouri.edu/bayesfactor>, choose your t -test (one-sample or two-sample), make $r = 1$ (nothing to do with correlation r), and enter t and N to

receive the Bayes factor. Alternatively:



The adjacent plot allows Bayes Factors and their interpretation to be estimated for any sample size and any t value. (Non-uniform behaviour at $N=20$ reflects the divergence from normality as N becomes small.) If no t value is available then a p value will do instead (follow the open circles), or an r value converted into t using $t = \sqrt{r^2(N-2)/(1-r^2)}$. Which means that generally all results in this book can be painlessly assessed.

Suppose you have tested chart factor X in a sample of Gauquelin data, say between 2500 and 12500 cases, and you get a p value of 0.05. An astrologer would typically conclude *the effect of X is proven* (hooray). But the Bayes Factor says the exact opposite – the result is medium/strong evidence *against* any effect. So p values are not the “solid informative scientific concept” claimed in the next summary.

The difference is due to the Bayes Factor accounting for both *no effect* and *effect*. Bayesian experts might note that prior odds play no part in its calculation.

The above exercise shows how p values are leading us to wrong conclusions. For a lesson on how it works see 7.7.2016.4. Note that the above Bayes Factor plot can check any result for which N and p or t or r via $t = \sqrt{(r^2(N-2)/(1-r^2))}$ are available, which is all of them.

Type II errors

A p value guards against falsely concluding *an effect exists* (a Type I error) but not against falsely concluding *an effect does not exist* (a Type II error). That is, a p value does not tell us if our sample size is large enough to detect an effect in the first place. Indeed, an estimated 60% of studies in psychology do not have sample sizes large enough to detect the effect they are looking for (JE Hunter, *Psychological Science* 8(1), 3-7, 1997), so in those 60% of studies the results are as meaningless as their p values. Hunter comments:

If the null hypothesis is actually true in a research setting, then the probability of falsely concluding [that the result is significant at $p = 0.05$] is ... 5%. If the null hypothesis is false [and it always is], then there is no reason to believe that the significance test will work right (p.4). [so a single significant outcome is not to be trusted]

Distribution of test data

Our data may not be distributed in the way required by the test. But some tests notably the t -test can tolerate quite large deviations from normalcy, and a few tests such as the runs test (see end of 8.7.11) don't care what the distribution is. Nevertheless our data may contain outliers, which many tests are sensitive to. US statistician Gary McClelland comments:

There are many ways in which one's data can become nasty and ill-mannered. Data recording and data entry errors have the potential for introducing whopping outliers. We may believe we are sampling from what appears to us to be one population but which in fact is several distinct populations, one possibly much smaller than the others. Or nature may just throw us a curve ball now and then to keep the game interesting. In whatever ways our data become irascible, it is important for us to detect the potential problems. ... the relevant procedures are mostly graphical and fairly simple (in HT Reis and CM Judd eds, *Handbook of Research Methods in Social and Personality Psychology* 2000:393).

The solution here is to plot the data so you can see what is happening (for examples see 8.6). Our final section looks at the correction for multiple tests:

Shoot enough arrows

If we make N tests, either one at a time or all together, then purely by chance we expect to get $0.05N$ results significant at $p = 0.05$, and $0.01N$ results significant at $p = 0.01$. But they will mean nothing unless specified in advance, in the same way that it means nothing to draw any playing card and declare $p = 0.019$ (ie $1/52$). The same applies if others have made N tests, even if we don't know about them, which is obviously a problem. So as a safeguard no result is admitted to science unless it has been amply replicated by independent observers.

Indeed, as noted in 7.7.2015.3, even the better results in psychology have proved to be poorly reproducible due to low-powered research designs and the pressure to publish positive results. Which is why hard-line critics tend to view psychology as a pretend science, and astrology as beyond hope. Most of the results in this book are one-offs awaiting replication. However a few have met the requirement for proper replication, for example see 8.3.7, 8.5.5 and 8.6, which is not to say their results are both significant and in the right direction (they aren't).

Back at the lab, if we make N tests, the true significance of our best observed p is

$$1 - (1-p)^N \quad \text{or approximately } Np \quad \text{or more accurately } Np - (Np)^2/2 + (Np)^3/6$$

a procedure called the Bonferroni correction. Thus if we make 12 tests and our best p is 0.01, the true p is roughly $12 \times 0.01 = 0.12$ (accurately 0.114). Conversely a sign would have to be significant at roughly $p = 0.05/12 = 0.0042$ (accurately 0.0043) to be genuinely significant at $p = 0.05$. If the multiple tests involve different hypotheses, eg house and sign placements, the entire set of p values can be assessed by various modified Bonferroni procedures. Here one of the simplest yet most powerful procedures is that of Benjamini and Hochberg (*Journal of the Royal Statistical Society B*, 57(1), 289-300, 1995:295). It requires non-rounded p values:

1. List all the p 's in increasing order of size, and number them $n = 1, 2, 3 \dots N$.

2. Moving sequentially from the N end, find the first p value that is $\leq P_n/N$, where $P =$ the control p eg 0.05 or 0.01.
3. Accept as significant at the P level those hypotheses with p values less than this value.

Comment Despite the above problems, we still report p values so that readers can improve the conclusions via the above Bayes Factor plot, which can accept any result for which N and p or t or r -via- $t = \sqrt{(r^2(N-2)/(1-r^2))}$ are available, which is generally all of them.



7.7.2016.4 Starting points for statistical studies

Kyösti Tarvainen. *Five starting points for statistical studies in astrology*. Written in 2016 for the 2017 Kepler Conference in Florida. Tarvainen, a former president of the Finnish Astrological Society, explains how in 2006 he began large-scale computerised astrological studies after obtaining part-time retirement from teaching mathematics, at which time the Gauquelin data had become available on the internet at cura.free.fr. So his large-scale studies mostly involve Gauquelin data and are claimed to have set new standards. He believes astrology works by essentially simple physical mechanisms, for example chart factors at birth might modify the working of genes. With thanks to Dr Tarvainen for his comments and for supplying copies of his articles.

Tarvainen's five starting points for guiding research are:

1. Ignore individual chart factors (which have been generally unfruitful), focus on multiple factors.
2. Focus on psychological astrology, the modern well-established form of natal astrology.
3. Focus on the claims of prominent psychological astrologers based on experience as opposed to speculation.
4. Focus on things that depend on the native, not on things like accidents and events that depend on others.
5. Because astrology depends on physics, symbolic or complicated methods seem unlikely to work.

To support his five points he cites ten of his high- N studies, all but one involving Gauquelin data, all of which achieved "statistical significance" or "very clear significance" or "overall statistical significance" or "clear statistical confirmation". He points out that:

The relatively large sizes of the data samples have proven essential to these successes, especially since it seems that many astrological studies have fallen through with smaller sets of data. Big data sets are necessary, since there are hundreds of astrological and non-astrological factors. In all studies control groups were used. In most cases the control groups were computer generated by shuffling and their validity verified by simulations.

Comment Tarvainen assumes that symbolic factors like planets and signs act in physical ways. But his tiny effect sizes are no reason to believe the effect is useful – and if it was real it would have contaminated virtually every experiment done in science, yet there is no evidence of contamination (Bunge, *Philosophy in Crisis* 2008). And why insist on complex statistical studies when simple tests of astrologers would do? Indeed his focus on psychology and not on accidents and events is remarkably opposite to the arguments of astrologer Ulrike Voltmer and psychologist Dr Bernd Kessler in their "Problem of reconstructing astrology" in *Zeitschrift für Anomalistik* 2, 218-244, 2002. Voltmer was then a director of DAV (Association of German Astrologers) and Kessler was in the psychology department of Saarland University. They point out that astrology's failure to convincingly pass empirical tests suggests either (1) there is nothing happening that needs astrology to explain it, or (2) astrology is being misinterpreted even though its symbolism contains clear correspondences with human life:

The astrological doctrine corresponds conspicuously to fundamental categories of human life. It is used as a kind of order matrix for human experiences, utterances and behaviours (p.232) [ie to encourage new or existing viewpoints].

People change, so anything based on subjective self-image (ie psychological astrology) will be problematic. But a cosmic situation linked to objective events lasting a finite time (eg transits) would generate testable statements. Which led to Voltmer's transit study in 7.4.2003.1.

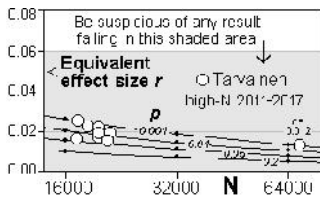
But Tarvainen considers only psychological astrology, and even then only in terms of *statistical significance* (never effect size) because it is "accepted practice", and p values are "a solid, informative scientific concept" (his comment 1(iv) on the *Correlation* website). But as shown in 7.7.2016.3, p values are generally none of these things.

Indeed, because his starting points never involve effect size or Bayes Factors, they effectively cling to the past and allow researchers to mislead the faithful (as in "very clear significance") when in fact nothing useful or practical may be happening. For more on this see below.

Examples of Tarvainen's high-N studies 2011-2017 with their p values are:

Classical synastry in the Gauquelin data. *Astrological Journal* 53(1), 2011. $N=20895$, $p=0.01$.
 Favourable astrological factors for mathematicians. *Correlation* 29(1), 39-51, 2013. $N=2759$, $p=0.001$.
 Venus-Saturn aspects and marriage. *Correlation* 29(2), 7-14, 2014. $N=20892$ families, $p=0.008$.
 Decisions re conception in G heredity data. *NCGR Research Journal*, 5, 58-70, 2015. $N=69969$, $p=0.001$.
 Major and minor aspects in Finnish theologian charts. *Correlation* 30(1), 29-36, 2015. $N=6285$, $p=0.01$.
 Moon's nodes in the synastry of the Gauquelin couples. *Correlation* 30(2), 27-37, 2016. $N=20895$ couples, $p=0.05$.
 Planets are strong by ordinary astrology in Gauquelins' groups. *Correlation* 31(1), 34-42, 2017. $N=23231$, $p=0.008$.
 Chart rulers work in the Gauquelin data. *Correlation* 31(2), 66-74, 2018. $N=20394$, $p=0.005$.
 Astrological factors put to the test. *Astrological Journal* 60(5), 40-47, 2018 (summary of his other studies).

But despite sample sizes typically $>20,000$, few are subdivided to see if the results replicate. Indeed, his comment 1(vi) dismisses this safeguard as a device to "divide and discredit" his results, which may well cause readers of 7.7.1983.5 to lose interest in his claims. Controls are generated by shuffling (which cannot tell mimics from genuine astrology see 7.7.2016.3), and for such large N s his p values are both unsurprising and unexceptional (range 0.05 to 0.001).



Furthermore, when the above p and N values are checked via Bayes Factor in 7.7.2016.3 only result #2 is better than *inconclusive* or *no effect*. When checked for potential artifacts via the test also described in 7.7.2016.3, the resulting effect sizes are a long way down in the grey area. Which is unsurprising since the Gauquelin data used in most of the above high-N studies is known to contain artifacts that most likely would not be controlled by shuffling. To claim the results have provided "very clear significance" for astrology is obviously unwarranted.

Tarvainen points out that combining his p values to give an overall p value via a χ^2 test using χ^2 for a df of $2n = -2(\log_e p_1 + \log_e p_2 + \dots + \log_e p_n)$ (often called Fisher's test, not the same as Fisher's exact test)

improves their statistical significance; thus combining nine nonsignificant values of $p = 0.2$ gives an overall $p = 0.05$. But this is just a statistical game. *It still says nothing about their genuine significance*. As a check convert $r = 0.012$ (see diagram) to its equivalent hit rate:

which for $r=0.012$ is $50(1+r)\% = 50.6\%$, where 50.0% is the hit rate expected by chance, see 8.2.1.

In other words our astonishment at his test of 69,969 Gauquelin parents reaching $p=0.001$ might well disappear when we find the hit rate is only 0.6% better than the 50% nominally due to chance. If we applied the results to 100 individual client readings, on average only one would be better than tossing a coin, always assuming the hit rate was real. But by ignoring such problems including those discussed in 7.7.2016.3, Tarvainen is able to conclude:

I am convinced by experience that there are astrological effects. Therefore, I am not surprised that one can get positive statistical results. But I am surprised that my own studies have overwhelmingly produced positive results.

But informed others might not be the least bit surprised. For more see 7.7.2020.6.

Additional comment Two of Tarvainen's high-N studies have individual summaries in this book see 7.6.2012.3, but are not listed above because the same lack of genuine significance applies to all of them, which inevitably leaves little room for fruitful discussion. His approach (combine factors to increase statistical significance) does not explain why astrologers can get apparently right readings from whole charts that, unknown to them, are actually wrong. In other words there is nothing here that contributes to what research requires for real progress.

Also it is self-evident that if everyday astrological claims (supposedly based on ancient observations and everyday experience) suddenly need tens of thousands of subjects and massive computing power to have any hope of detection (and still fail), we have a serious problem in need of a serious resolution. Which is precisely what Tarvainen's studies fail to provide.

7.7.2017.1 Experimental design to validate chart judgements

Aleix Mercadé. Diseño experimental para la contrastación del hecho astrológico, 48pp. Personally communicated by the author and his research group in the Cosmograma school of astrology, see 7.7.2014.2. Their initial tests were the only recent tests of astrologers made anywhere but were inconclusive because the subjects' knowledge of astrology was not controlled. This outline of experimental design is among the most comprehensive ever written in astrology.

In 1879 Wilhelm Wundt founded the first laboratory of experimental psychology, which in due course led to major advances in our understanding of mind. The same is potentially true of astrology, except its reliance on symbols makes testing difficult. Nevertheless experiments are needed, otherwise astrology will be impoverished in the same way that pre-1879 psychology was impoverished. The questions to be answered are quite straightforward: Does the natal chart describe the person? Can it describe their life and circumstances?

If astrologers were able to repeatedly discriminate between a couple of natal charts (one true and one false) with statistical significance, and this only from information collected by a personal interview or a questionnaire, we could declare the existence of astrological phenomena (p.3).

The above approach is that of matching tests as pioneered in astrology by Vernon Clark. Our current experimental design is the result of work that began in 2008. By the end of 2016 five pilot tests had been carried out based on (1) questionnaires, and (2) face-to-face interviews.

Questionnaires. Five astrologers were each given the same two anonymous charts. The owner of one chart had filled in the 16 PF (from www.psicologia.online.com/test/) and our own questionnaire asking about personal life, beliefs, relationships, family members, work, hobbies, spiritual life, and important events. Each astrologer used the answers to decide which of the two charts belonged to the subject. All answers that could reveal age had of course been removed. When the test was finished the correct chart was not disclosed (this was important).

Interviews. The owner of the authentic chart then faced each astrologer (who still has the two charts) and answered questions designed to find out which chart was theirs. Questions related to age or named chart factors were not allowed.

There were respectively 25 and 20 subjects, of which 15 were common to both, with hit rates of 82% and 67% vs 50% expected by chance. Unfortunately we discovered that 16 of the 25 and 10 of the 15 knew something about their chart (via books, the internet, or consulting an astrologer), which would explain how the astrologers could choose the correct chart. We have therefore improved the design but have yet to put it to the test. [Still not done by 2022]

Our improved experimental design

Obviously a birth chart is a complex mix of factors extending well beyond twelve signs of the zodiac. So our improved design involves an *Índice de Pureza Astral* (IPA) or Astral Purity Index, where for each natal chart we indicate how pure it is (high, medium, or low) depending on the extent to which it concentrates or disperses the variables. In effect the IPA would define the archetypal purity or strength of a chart, or in engineering terms the signal/noise ratio.

For example a *high IPA* might have factors like (1) Sun angular, (2) Sun's ruler in the sign occupied by the Sun, Ascendant or MC, (3) Ascendant or MC ruler, or the Moon in the same sign occupied by the Sun, while an *average IPA* would have the same except read element for sign. The actual criteria would need checking by computer to make sure their frequency was realistic, and to ensure that the control chart was similar in IPA to the authentic chart. In principle a calendar could then be produced showing when high IPA periods existed, always assuming that success really was related to IPA scores, that the validity of the chosen factors could be demonstrated, and that their sheer number did not destroy the idea in the first place.

Another complexity is the potential for blockages, traumatic experiences or difficulties, ie where the natal chart no longer represents what we are but what we can become, which in turn depends on variables such as environment and health that go beyond the astrological. For example the relevance of eminence (Gauquelin) means we need to add an *Índice de Madurez* (IM) or Maturity Index based on a questionnaire asking about recognitions and prizes, and on citations that can be found by a Google search.

Of course any design will have three inescapable variables (subject, case history, astrologer), each of which we need to quantify if our research is to be rigorous and precise. Here we can

start with the IPA, and the hit rate and confidence after an interview with each subject that is video recorded for later analysis. Thus we might predict that the best results would reflect a combination of high IPA, high confidence, and a *low* general success rate by *non*-astrologers. Although each astrologer's confidence in their judgement costs nothing, it is essential for assessing results and should not be omitted (unfortunately it was neglected in our pilot tests).

Finally we must control for the subjects' knowledge of astrology by measures we can call (in Spanish) **(1)** *Conocimiento Carta Natal* (CCN), or Natal Chart Knowledge, either they know or they don't. **(2)** *Creencia Astrología* (CA) or Belief in Astrology, either yes, no, or uncertain. **(3)** *Conocimiento Propósito Experimento* (CPE), or Awareness of the Experimental Purpose, either they know, ignore, or suspect. These measures might then predict more hits from:

- CNN who know vs CNN who don't know.
- CA believers vs CP non-believers.
- CPE who know vs CPE who are ignorant.

For completeness we should also look at other differences such as young subjects vs old subjects (especially those outside our target range of 30-60 years), interview vs questionnaire (ie personal contact vs no personal contact), how subjects are recruited (via our website, via mailings, via social media), the effect of increasing the number of charts to be matched (two vs more than two), and perhaps software A vs software B. [Although our pilot tests showed the hit rate was higher for interviews than for questionnaires, this is arguably no more than expected given that many subjects knew something about their charts, in the same way that astrologers were able to guess a subject's sun sign after an interview, see 7.1.1983.2. We must be very careful here because cues can be leaked in ways that are not necessarily obvious.]

Practical details

To minimise sampling errors in the selection of subjects it is always preferable to have many subjects and few astrologers rather than vice versa. So the initial target might be 90 subjects willing to attend an interview in Barcelona, and who form groups of roughly equal size in terms of CNN, CA, CPE, IM, and IPA, which may of course require a much larger pool of subjects (say more than 180) to allow the selection of equal numbers.

The interview will be recorded in both audio and video, will more or less follow a set pattern, but will otherwise reflect the personal approach of each astrologer. Ideally they will have a computer plus appropriate software such as Solar-Fire and Astro-Nex to calculate whatever additional data such as transits, solar revolutions, and progressions may be thought necessary (such help was not available in our pilot tests).

Each astrologer will receive two anonymous charts (one authentic, the other a matched control as described below), the questionnaire answers and 16 PF results, and various sketches about the person's activity that could help describe their personality such as personal blogs and social media information, in all of which care has been taken to avoid personal data and names that could bias the test. The sun sign and place of birth can be revealed since the control chart will be created for the same sun sign, birth place and IPA as the authentic chart.

Comment The use of IPA and IM indexes are excellent ideas not previously proposed, but their value will depend on suitably large effect sizes being demonstrated for their respective criteria. Unfortunately, as shown by the tests in this book, the prospects do not seem good. Nevertheless the author's team should be congratulated for focusing on tests of astrologers, which are arguably the only tests relevant to the application of astrology to individuals.

7.7.2017.2 Imbalance in astro searches on French Google

Serge Bret-Morel, *Traitement de l'information: croyance et scepticisme dans les recherches Google*, published on the author's website astrosept.com January 2017. For the author's impressive investigative background see 2.11.

In his 2014 book *La démocratie des crédules* [The democracy of the gullible], the investigative

sociologist Gérald Bronner shows how a French Google search with only one keyword (the most numerous) such as "astrologie" will not provide an informed opinion from the first 30 Google results. In this case there were 28 favourable to the belief, 1 unfavourable, 1 neutral, an imbalance that reflects the superior number of astrology sites over the number of skeptic sites. Bronner found that 99% of users do not look beyond the first 30 results, therefore they will receive results in proportion and remain highly uninformed.

I wondered if, at the end of January 2017, these figures given in April 2014 had changed, and whether, by a careful choice of search terms, it was possible to make the search more balanced. To find out I tried searching with particular keywords (the answers were No and Yes respectively). The first five pages for searches made on French Google during 22-26 January 2017 broke down as follows. The totals vary between 49 and 60 because some results such as a film review were not relevant:

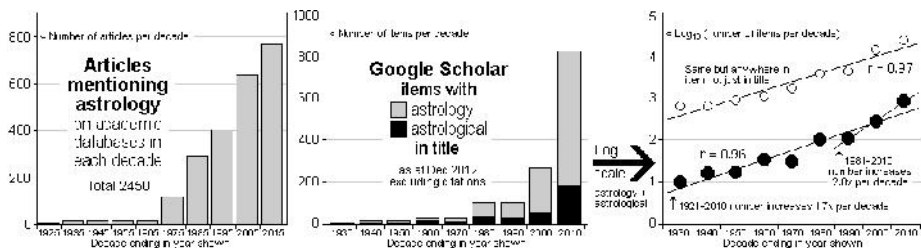
Keyword	---- Result for astrology is ----			Note
	Favourable	Unfavourable	Neutral	
Astrologie	51	4	4	1
Horoscope	59	1	0	2
Zodiaque	26	1	22	3
Astrologie zététique	3	38	10	4
Astrologie critiques	17	18	15	5

Notes

1. One result with critical content in first three pages. So no change since 2014.
2. Results almost entirely re chart reading, no critical content in first 14 pages.
3. Zodiaque is not among the Google adwords chosen by astrologers.
4. Zététique = investigative. This approach is rarely evident in astrology world.
Searches for "horoscope zététique" gave nothing favourable in first 60 results.
5. Balanced in numbers only from the third page.

Conclusion: As I feared, single-word Google searches on astrologie, horoscope and zodiaque do not provide the resources that would be needed to quickly build an informed judgment. To have access to unfavourable opinions (those that include questions of chance, biases, errors of reasoning, and lack of evidence) it is necessary to include a second (critical) search term. Undecided internet users who do not wish to lose positive opinions on astrology may well prefer two searches: the first without the critical term, the second with. To save time, I advise them to do the opposite! Finally be aware that the French Wikipedia page is largely pro-astrology. For example there is no mention of cognitive biases, and no critical arguments are described in detail. It addresses a handsome man of straw.

Comment The author did not make the same tests on English Google, where the total pages reported (thousands or millions) for the equivalent English keywords can be many times those reported by French Google, and the classification of each result can be much less clear. But the imbalance is much the same. There is no equivalent in English to *zetetic*, and substitutes such as *critical* / *skeptical* / *investigative* / *scientific* are not as efficient (and gave different results, albeit with some overlap). So never search English Google for plain *astrology* but for things like *tests of astrology* or *astrology and science*. One reason for the imbalance is presumably the direct or indirect bias imposed by the search engine in favour of paying advertisers.



Regardless of any imbalance, the number of articles mentioning astrology reported by English academic databases (left) and by Google Scholar (middle) is rapidly increasing – even exponentially for Google Scholar (far right).

7.7.2018.1 Can a conflict of interest result in biased criticism?

Robert Currey. *Why it is unscientific to claim astrology is rubbish* and associated articles on his websites www.equinox-astrology.com & www.astrologer.com at October 2018, totalling more than 50,000 words or 100 printed A4 pages.

Tell Robert Currey three things about you and he'll tell you everything about yourself.

Like you, your Equinox Horoscope is unique. And from just three pieces of information – your name, time and place of birth – our unique insight into your life. The Equinox horoscope tells you, in a way you can understand, what you are, what you want, what you need, what you can do, and what you should do. It gives you the insight you need to know who you are, what you want, what you need, what you can do, and what you should do. It gives you the insight you need to know who you are, what you want, what you need, what you can do, and what you should do.

Robert Currey, *Equinox Astrologer*

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Table:

Date of Birth	Time of Birth	Place of Birth	Fee
1980	12:00	London	£100
1985	14:30	Paris	£120
1990	16:45	New York	£140
1995	18:20	Tokyo	£160
2000	20:15	Sydney	£180

Contact: Robert Currey, Equinox Astrologer, 100, The Strand, London WC2R 0AL, UK. Tel: 020 7460 1234. Email: robert@equinox-astrology.com

In 1981 Robert Currey founded his astrological company *Equinox* as part of his work as a consultant astrologer, writer and teacher. Later he wrote software to computerise his chart readings – natal, children, compatibility, yearly forecast – all dispatched within 24 hours of payment (posted prices range upwards from £28, \$US40, \$A60).

The demand led him in 1989 to open the *Astrology Shop* in London, said to be acknowledged as the world's leading astrological shop. It stocks over 1500 astrology titles, plus calendars, software, videos, and zodiac cards. In the 1990s he opened offices in Sydney NSW and Portland OR to look after booths at exhibitions and to support his services including personal telephone consultations by his team of astrologers for which he charges £90, \$US150, \$A210 per hour.

Currey devotes his large efficient website not just to promoting his diverse astrological goods and services but also to attacking any studies and public pronouncement that are negative towards astrology. Since he includes studies reported in our earlier books and repeated in this one, his attacks provide an opportunity to explore the extent to which a conflict of interest can bias criticism of astrology – one which our readers with access to his website can now check for themselves.

◀ Full page ad for *Equinox* charts and consultations on the back or inside covers of the Australian edition of *Dell Horoscope* in 2018.

First, let us be clear about what a conflict of interest involves and how we might reasonably suppose it to exist. In 1977 the critical review *Recent Advances* stressed that very few of its 52 collaborators from 10 countries made a living from astrology, for the good reason that:

vested interests are hardly compatible with the requirements of a critical and unbiased review (p.10).

Or as the prolific US author Upton Sinclair (1878-1968) famously said in 1935:

It is difficult to get a person to understand something when his salary depends on his not understanding.

Thus we might reasonably suppose that *nobody with a large financial stake in astrology could possibly afford to admit there is convincing evidence against it*, and of course vice versa for anyone with a financial stake in its invalidity such as a psychotherapist facing ruin due to the booming astrological business next door. Judged by the details given above, Currey's financial stake in astrology is not just large but huge, or at least larger than most. So we can focus on his attacks to see how they work and how they might be biased. Let's start with an overview.

Overview

Essentially Currey's approach is to (1) Dismiss negative results on the grounds of bias or ignorance. (2) Accept statistically significant results as positive regardless of how uselessly small their effect sizes might be. (3) Ignore the other side of the story. (4) Never deliver what is required of all instruments used for psychological purposes, namely the results of controlled studies showing acceptable validity and reliability – indeed, until this happens there is really no point in continuing, but for completeness we continue anyway starting with his first attack:

No grounds for dismissing astrology as unscientific

Currey asserts that many critics dismiss astrology as unsupported by scientific tests because they are either ignorant (astrology deserves informed study) or they are attacking a straw man (sun signs are not astrology). To illustrate how they get it wrong he asked numerous critics to cite their best single test against astrology. Here are three of their responses together with Currey's comment, and in [] the other side of the story:

Carlson's double blind test – it actually shows significant positive results $p=0.037$ [but see 7.6.1986.2].

Dr Geoffrey Dean's meta-analyses – these are good examples of confirmation bias [but see 8.6.3].

James Randi's \$1m challenge – he makes it too difficult to be plausible [but see 8.8.6].

He then presents this reasonable challenge:

I invite anyone reading this to produce or even devise a test of astrological practice that is not fundamentally flawed. I don't have the time and resources to evaluate more than one test at a time [a point contradicted by his website].

Finally he says many statistically significant results have been published by researchers such as Vernon Clark, Fuzeau-Braesch, Gauquelin, Ruis, and Tarvainen, with p values typically <0.05 or better. So he claims there are no grounds for dismissing astrology as unscientific.

Comment But the criterion for being scientific is not the apparent passing of tests but the approach to astrology by its practitioners, which is conspicuously non-scientific see 11.3. His supposedly positive results never involve *practical* significance (ie effect sizes) but *statistical* significance uncorrected for selection bias (which inflates that significance). And they typically lack replication, without which no result is considered worthy of the scientific status he is claiming, see 7.7.2015.3. His list even includes studies of unlikely relevance to a consultation such as those of dogs or serial killers, and studies of zero relevance such as those linking moonlight with insect behaviour. On the other hand, studies of obvious relevance such as those of astrologers and their clients tend to be ignored.

But his asking critics to cite their best single test against astrology is misconceived in the first place. When testing a claim or theory, it is the cumulative evidence that is important. And critics have many ways of assessing astrology other than by failed tests that astrologers ignore anyway, such as its inability to compete with modern theories (especially those in psychology) that explain it and its apparent workings far more plausibly than *as above so below* does.

Indeed, if his claim were true (that no test of astrological practice could be made that was not fundamentally flawed), then such practice would be automatically unethical. In effect every astrologer would be telling their clients "Although I am charging you money, neither I nor anyone can prove that what I say is valid or true or useful, but trust me, I'm an astrologer".

Problems of testing astrology under strict scientific conditions

According to Currey there are several problems that face any tester of astrology:

- Lack of data that is objective (who selected it and how?) and accurate.
- The large number of variables in both astrology and human behaviour.
- Replication is impossible since each birth is unique and planetary positions do not repeat within recorded history.
- Open to experimenter bias, so statistics can be meaningless.
- No funding and limited scope for university research.

But he suggests the following requirements might make an experiment possible:

- More flexible rules and a new multivariate methodology.
- Appropriate data, funding, expertise.
- Test astrologers, get them to rank the strength of effects.

Comment If Currey is correct, how is it possible for people in history to have quite casually confirmed that astrology works (see next) while scientists using refined methods have had no success? Astrology cannot simultaneously be difficult to test and easy to prove. If astrology really has been impossible to test scientifically, then astrologers could never know it works and it automatically becomes a pseudoscience, or a non-science like tea leaves, at which point the ethics of using it to make money become a concern, see above.

History shows that astrology was discovered not invented

According to Currey, scholars in early Mesopotamia observed and recorded diverse celestial phenomena that allowed them to predict eclipses. In this way:

the foundations of modern astrology were established empirically. The Babylonians derived the nature of the planets, the twelve signs of the zodiac and the birth chart. They also pursued early theories about sign rulership and elements. These academics are generally considered to be the first scientists. So, the first known astrological discoveries appear to have been made using the scientific method. Observations were followed by data collection, analysis, prediction and finally onto publication.

Comment (1) Currey notes that our *Astrology under Scrutiny* 2013 contradicts this, and claims that when he showed how the contradiction was wrong (he did this by simply ignoring the arguments and asserting the opposite) the section was removed from *Tests of Astrology*, which clearly proved he was right. In fact it was not removed and exists on pages 19-28. It is expanded in the present work in Chapter 3. (2) Notice how, in early Mesopotamia, the many problems of testing astrology scientifically (which Currey stresses in the previous section) have suddenly disappeared. (3) Notice also how Currey does not dispute our arguments by quoting experts on the history of astrology such as Nicholas Campion, which is understandable when you discover that Campion actually agrees with us about the origins of astrology:

The myth that astrology is based on observation was fostered by the ancient Greeks who liked to pretend they were rational, and could only justify astrology by the fiction that the Babylonians had records of such observations extending for anything up to 470,100 years. The available evidence indicates that astrology owes its origins to early religion and magic, incorporating fertility cults, worship of the celestial bodies and a range of other irrational practices (letter, *Astrological Journal* 28(2), 76, 1986).

Dr Geoffrey Dean and research skeptical of astrology

Currey says he is a professional astrologer whereas Dean is a professional skeptic, a member of the Committee for Skeptical Inquiry (CSI, formerly CSICOP) who regularly publishes in *Skeptical Inquirer*. So Dean is automatically against astrology and cannot be trusted:

To an astrologer, his [Dean's] working career appears to be dedicated to the impossible task of proving that there is nothing "out there"! No astrologer has ever had the resources and time to produce even a fraction of his work.

Dean's most famous experiments (genuinely good science or just smoke and mirrors?) are:

His time-twin work, which is unpublished, and his use of serial correlation is flawed [but see 8.7.10].

His meta-analyses are flawed and his use of effect sizes hides the importance of significance [but see 8.6].

His matching test of charts vs EN are flawed because no astrologer makes claims re EN [but see 7.6.1985.2].

Is astrology relevant to consciousness & psi? is flawed because psi has nothing to do with astrology [but see 7.7.2016.1, which among other things makes it clear that the authors Dean and Kelly are not making that claim].

Comment (1) One could just as invalidly argue that people who regularly publish in *Astrological Journal* are automatically for astrology and cannot be trusted. The only thing a skeptic is automatically against is putting unsupported opinions before impartial evidence.



(2) If a professional is someone who gets paid for his work, then Currey certainly qualifies while Dean just as certainly does not. Since 1982, when as a working astrologer he abandoned reading charts for money as unethical, he has made no money from astrology. He is not a member of CSI (it is not something anyone can be a member of), his supposedly regular articles in SI appear about once every eight years (not all are on astrology), and his career as a technical editor has never depended on astrology.

Currey in 2017, the year he received the Charles Harvey Award for astrological excellence.

(3) Since well before the publication in 1977 of *Recent Advances* compiled with Arthur Mather and 52 collaborators from 10 countries, Dean has always worked as part of a team. The implication that Dean works alone is incorrect. Astrology is beyond just one person's expertise.

(4) The team has done far more than compile articles – it has conducted research, organised collaborative surveys (7.7.1994.1), sponsored various prize competitions (8.9.10.2), promoted the case for astrology (11.7), and has always insisted that astrology is more than being true or false. So it makes no sense to see it as automatically against astrology.

Are there physical mechanisms that explain astrology?

One supposedly core objection to astrology (no known physical mechanism to explain how it works) is invalid because many practices (magnetism, electricity, antiseptics, gravity) were in use before they were explained. In fact astrology may work by several mechanisms (tidal resonance, synchronicity, quantum entanglement), and future physics may well provide others.

Comment Or it may not. In exactly what way is astrology more like magnetism/electricity/antiseptics/gravity than it is like say tea leaves? What price vague mechanisms when there is no useful effect to explain nor useful levels of agreement (7.6.1985.2 for example)?

In summary, we might notice how conflicts of interest seem to dominate everything:

(1) The default defence against criticism (tests of astrology are automatically flawed) cannot be true otherwise astrologers could never know that astrology works. Nor could astrology have been progressively refined (as Currey claims) over the centuries. Indeed the tests in this book – many by reputable astrologers – confirm that the default defence is an illusion.

(2) Despite all the talk about testing, the assumption is that astrology is true all along. Critical studies showing useful effect sizes – the same kind of studies that led former astrologers like those in Chapter 2 to abandon astrology-for-money as unethical – are conspicuously absent.

(3) Indeed, the pious arguments about lack of resources and funding sit uncomfortably with *Equinox Astrology's* operating financially in three countries. We might reasonably ask why *Equinox* has not applied its resources to demonstrating useful effect sizes commensurate with the claims it makes in ways that would hold astrology to the same high standards as in any other field. The tests in this book suggest a clear answer – *Equinox hasn't done so because it can't* – and vested interests would not allow it anyway in case it failed. The response to our question (can a conflict of interest result in biased criticism?) is most obviously Yes.

7.7.2018.2 Serial correlation doesn't measure serial similarity

Kyösti Tarvainen. Dean's serial correlation method doesn't work in time twin studies. *Correlation* 32(1), 75-79, 2018.

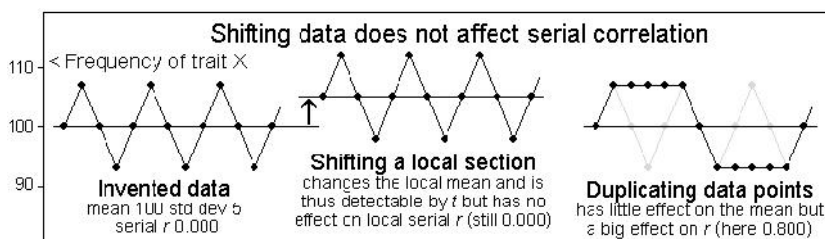
Tarvainen dismisses Dean's time twin study in 8.7.10 because it did not use *t*-tests and falsely concluded from simulations that the serial correlation test is "sensitive and working":

these simulations are not realistic; there are no astrological factors that would produce these kinds of effects where every two or four hours a variable value and its next value (after some 5 minutes) are the same (p.77).

To support his dismissal Tarvainen generated a normal distribution of IQ scores (mean 100) in which the scores for births during the approximately two hours when Mercury is in first house were increased by 5. The difference by *t*-test was significant ($p=0.03$) whereas the mean serial correlation was not ($p=0.48$ for $r=0.008$). So he concluded that serial correlation:

is a surprisingly weak method to detect astrological effects and, in practice, totally unreliable. Hence Dean is not right when he says that "according to astrology the serial correlation in this data [in 8.7.10] should be strongly positive" ... Therefore, Dean's time twin study is not an indication of astrology's invalidity (p.78).

Comment (1) Dean did use *t*-tests in the way Tarvainen denies (ie to measure differences between group means, see 8.7.11). In any case *t*-tests cannot measure the similarity between consecutive time twins, but serial *r* can. (2) Serial *r* is unaffected when data is bodily shifted up or down (as in his own test), so it is necessarily "a surprisingly weak method for detecting such a shift". Nor does it simulate similarity between consecutive time twins, see diagram.



Left: The above problems are illustrated here with invented data of $r = 0.000$. **Centre:** Adding a fixed amount to each data point has no effect on local r . **Right:** Duplicating data points (Dean's approach) simulates astrology and thus increases local r .

(3) Tarvainen assumes that astrological effects vary in tune with isolated factors (here Mercury in first house) that are assumed to be relevant. In effect he is assuming what he wishes to prove, namely that time twins are astrologically determined in the way he says. Whereas in Dean's study the predicted similarities between consecutive time twins are assessed directly by

measuring the actual time twins on hundreds of variables said to be relevant, which approach makes no assumptions about how astrology might make them similar. (5) The guest editor of *Correlation* for that issue uncritically parrots Tarvainen's supposed "cause for concern":

Dean's use of the serial correlation method, rather than a more appropriate statistical test. ... Rather than invalidating astrology, Dean's experiment may be a case of of [sic] inappropriate research design (p.75).

It suggests *Correlation's* official policy is to put propaganda before scholarship. See next:

7.7.2018.3 Propaganda or scholarship?

Courtney Roberts. Guest editorial, *Correlation* 32(1), 5-6, 2018, in which she looks at research since the original *Correlation* began in 1968. She tells us that since then:

Correlation alone has consistently upheld the highest standards of research in astrology. ... The accelerated pace of current research bodes well for the future of astrology and for the future of *Correlation*. The demand for peer-review and publication of astrological research will only increase in the coming years, as more astrologers, and their clients, recognize the distinct advantages of evidence-based practice. ... As the evidence compounds, the next steps are systematic reviews and eventually, meta-analyses. Maybe we should all take a moment to let that sink in.

Comment But journals such as *AinO* and *APP* upheld higher scholarly standards than those currently held by *Correlation*. Peer-review by astrologers does not guarantee high standards (think of cherished beliefs, vested interests). The pace of research is not increasing (count the studies). Systematic reviews and meta-analyses already exist. Propaganda 1, scholarship 0.

7.7.2019.1 Astrology and three kinds of truth

Garry Phillipson, *Astrology and Truth: A Context in Contemporary Epistemology*. PhD thesis, University of Wales, Trinity Saint David, 369 pp, over 99,000 words and a bibliography of nearly 700 entries referenced by nearly 1400 footnotes.

Some definitions based on *A Dictionary of Philosophy* (A Flew ed) 2nd Edition 1983 and the regularly updated *Internet Encyclopedia of Philosophy*: **Epistemology** is that branch of philosophy concerned with the nature of knowledge, where it can come from, what it can cover, and the reliability of its claims. **Philosophers** in university departments of philosophy (cynically seen by some as obsessed with splitting hairs) recognise three main kinds of **knowledge** – practical (how to bake cakes), factual (water freezes), and personal (I was there). As for **truth**, before the 19th century they might well have agreed that no more need be said than the everyday definition "conformity with facts, agreement with reality", which is how most people see it ("it's true that I left the pub at 9:30 pm but not true that I went straight on to another"). But depending on how we define *true* (accurate, certain, factual, genuine, loyal, proper, reliable, sincere, valid) we can generate different theories of truth, reducing everything to arguments about the meaning of words. From this confusion most modern philosophers have settled on **three main kinds of truth**:

- **Correspondence** (truth is what fits the facts), historically the most popular and least problematic.
- **Pragmatism** (truth is what works or is useful), which has potential problems when (1) for some people like Fred it isn't useful, and (2) it is still useful even if objectively false, as in "everyone loves Fred".
- **Coherence** (truth is what is consistent with other truths or a system of truths). Thus "elephants are X" is consistent with truths about elephants if X = big but not if X = pink. It is more problematic than the other two because it still applies when "other truths" are replaced by "other beliefs" or "claimed truths", which may actually be false.

Phillipson looks at each kind of truth in a detailed survey of philosophical arguments for and against astrology, including astrology-as-**science** and astrology-as-**divination**, all extracted from a huge scattered literature.

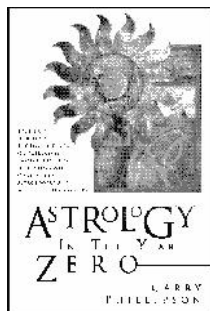
Phillipson makes wide use of Dean et al's focus on astrology-as-science, quoting from nineteen of their publications including *Recent Advances* and *Tests of Astrology*. He explains:

Dean and his collaborators [Kelly, Mather, Nias, Smit, sometimes with Ertel] have contributed critiques of astrology to many encyclopaedias, journals and other texts, so that their perspective is often implicitly presented as authoritative, and is drawn on by many critics of astrology. For instance Culver and Ianna [*Astrology: True or False?* 1988:220] acknowledged having no experience of using astrology, and instead made extensive use of works by Dean et al (p.48).

How could the incomprehensible be comprehended?

Phillipson says "I learned to calculate and interpret astrological charts in the 1970s and have been involved in studying and using astrology since then" (p.27). In 1976 in the UK he graduated in philosophy but was becoming disillusioned with Western systems. Between 1986 and 1993 he studied Buddhist philosophy as an ordained monk. After leaving the monastery:

I was met with a most discouraging scene ... the existence of any scientific basis for astrology was in doubt. ... None of the astrologers I spoke to seemed much concerned by this ... Hence my interest in examining the truth-status of astrology ... in 1996 I began working on *Astrology in the Year Zero*, which was published in 2000. This is largely comprised of interviews with astrologers and critics of astrology [in an] attempt to evaluate and present arguments for and against the truth of astrology (pp.28-29).



Phillipson's interviews with 25 astrologers (usually in person) and five researchers (Dean, Ertel, Kelly, Mather, and Smit collectively by email) "was not to arrive at final answers, but ... to create a context within which informed discussion might take place ... One of the many questions that remain is how, if astrology lies beyond the comprehension of the rational mind [a popular view among his astrologer interviewees], it could fall within the ambit of human participation" (p.196). In an attempt to answer to this question he began his thesis in 2003.

Early results appeared in his article "Modern science, epistemology and astrology" in *Correlation* 23(2), 4-23, 2006, in which he presented two models of astrology. Model 1 based on a link between above and below. Model 2 based on a link with the divine. But Mather in *Correlation* 26(1), 53-59, 2008 points out that neither model explains why the universal ex-

perience that "astrology works" fails when non-astrological factors are controlled, whereas a third model (Model 3) does this very simply by seeing astrology as:

the inevitable result of astrologers failing to control for non-astrological factors, which are then mistaken for genuine astrological effects. ... From the way Phillipson allows such issues to be raised in his book ... only to ignore them in his summary chapter *What is Astrology?*, and from his chart interpretations that appear in the astrological literature, it seems that Phillipson is a committed believer. The point is, if we believe in astrology then according to Model 3 it will most likely work for us. If it doesn't work then ... we will ignore inconvenient issues, find a reason for its failure, and continue to believe in it, thus preventing reality from conflicting with our beliefs (p.59).

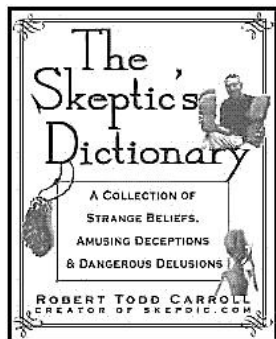
In his reply (pp.59-64), Phillipson evades the issue:

The way I see it ... a discussion such as this needs to take account of the belief systems of its protagonists. For Arthur Mather the foundation on which this type of discussion should rest is the scientific method generally and astrological testing in particular. For my part, I question the belief that, where astrology is concerned, testing is the best and only tool for discriminating the real from the imaginary. I suggest that Mather's beliefs play an unacknowledged role in shaping his argument. [For example Mather says] "if nothing is testable then astrology becomes indistinguishable from fantasy". This would need to be justified in a rebuttal of my argument. In Mather's article it is simply asserted as if there could be no other way of thinking. [So] I find it difficult to engage with his comments. (p.60)

Having questioned whether tests can tell the difference between reality and fantasy, he adds:

I am sufficiently well aware that it is possible to explain astrology in terms of perceptual and inferential biases, etc. I have no argument with this as a possibility that should be borne in mind and considered. But it is also possible to explain astrology in terms of an animate universe that is capable of furnishing us with signs. *Should we live as if we are in a dead, inert universe, or in a living, responsive one?* ... The question goes beyond the realm of the scientifically measurable, to questions of what we know, how we know it, and what we should do about it. (p.61, his italics)

Phillipson is suggesting that an animate universe, responsive to the needs of billions of people simultaneously, explains their experience of astrology better than the proven effect of human biases. But this is simply asserted as if it was impossible to tell one explanation from another. There are no examples of ways better than tests for discovering whether people with charts containing X are more X-ish than people with charts not containing X. To him, many mysteries exist for explaining astrology (gods and daemons are only a start), all conveniently beyond scrutiny and therefore all seemingly profound when dressed in philosophy-speak. So which is more likely – ignorance of the many cognitive biases and illusions known to hinder our ability to think clearly, or a universe for whose animate nature there is no observable evidence? Here Phillipson accepts known biases as a *possibility that should be born in mind*, as if their known reality was of no consequence and unsupported assertions counted as arguments. However:



Other philosophers accept biases as important. For example the late Robert Carroll, Professor of Philosophy at Sacramento City College, author of the 2003 *The Skeptic's Dictionary* and creator in 1994 of the associated website (now with 700+ entries including essays, book reviews and replies to comments from its 400,000 visitors a month), collects such biases under what he calls the soothsayer's delusion, all with copious references in support of each point:

The soothsayer's delusion is due to the natural inclination of human beings to rely on magical thinking, to find meaning where there is none (apophenia), and to see significant patterns in insignificant noise (pareidolia). ... Soothsayers and those under the sway of the soothsayer's delusion mistakenly think that the elaborate systems of some

astrologers, card readers, psychics, palm readers, etc. that provide satisfying readings for so many people is clear proof that the systems are "real" and that their craft is grounded in scientific evidence. What drives success in these fields is ignorance of ... the many cognitive biases and illusions that hinder our ability to think critically.

In effect Carroll is pointing out that, unless our ignorance is corrected, anything goes. That the result may be incomprehensible or implausible doesn't matter. Believing is seeing:

Soothsayers bring order to a disordered world. They provide guidance and structure and meaning to lives desperately in need of such. It doesn't matter that what they tell people is based on some elaborate system that has no basis in reality or whether it is made up on the fly. As long as the subjects can find meaning and order in what they are told, they will be satisfied. Carroll cites the experience of US novelist and Pulitzer-Prize winner James Michener (1907-1997) as described in Chapter 12 of Michener's memoir *The World is My Home* and in an unpublished manuscript kept at the University of Northern Colorado. As a young man in Egypt Michener had learned how to tell fortunes, which he later practiced for charity as Mitch the Witch. He had been told: "People desperately want to have their lives put into order. They long for structured situations. The structure doesn't have to be reasonable or even sensible; it merely has to be firm." Although Mitch the Witch was amazingly successful, he gave it up when he realized that an off-the-cuff bit of nonsense that he'd made up would be taken as guidance. It wasn't worth it to see people deluding themselves. The power he had over people "finally compelled me to stop giving readings ... they deserved better guidance than I could give them." So he quit, and "the comedy ended." (from Carroll's website entry on the soothsayer's delusion).

Back at *Correlation*, Phillipson's article does not describe the ways that are supposedly better than testing for discriminating between reality and fantasy, which closes this window of opportunity for further dialogue. But he later re-opens it with his 2019 thesis:

This thesis is an investigation of claims regarding the truth-status of astrology. These claims typically come from advocates of astrology and critics of astrology. ... The enquiry presented here has grown out of my book *Astrology in the Year Zero*, in particular my contention that any evaluation of astrology "will be based on one's view of issues such as: what is real; how we acquire knowledge; and how our knowledge relates to reality. In other words, philosophical issues which are as old as philosophy itself" (p.1, the quote is from page 195 of his book).

His thesis is therefore the result of more than twenty years of remarkable explorations of the philosophical issues involved in the truth-status of astrology, making it roughly the equivalent of a philosophical *Recent Advances* or *Understanding Astrology*. In contrast, their explorations of empirical issues are essentially based on "forget philosophising and the T word, just test to see if astrology actually works with and without hidden persuaders, always with controls and replication", which is precisely the approach that Phillipson questions in his thesis. To him the assumption that philosophy can be ignored is unacceptable, as if debating the nature of truth could save you if you jump off a cliff. His explorations and his conclusions are as follows:

Correspondence (truth is what fits the facts)

Phillipson's examples of tests include Gauquelin planetary effects, Shawn Carlson, Vernon Clark, and Roberts and Greengrass. Their various disagreements show how "the poor results found in astrological research could be due to a lack of sophistication in the astrological model that is applied" (p.136). The contrary view expressed by Eysenck and Nias in 4.6.3 is ignored.

He points out that matters of *meaning* identify the difference between astrology-as-science and astrology-as-divination (p.157), and that "to focus on facts without allowing for meaning is to neglect a significant part of the picture" (p.161), a point he explores under coherence. His conclusion re correspondence is "there is little basis to judge [astrological] practice true" (p.321)

Pragmatism (truth is what works or is useful)

Phillipson cites Dean et al's division into objective astrology (needs to be true) and subjective astrology (does not need to be true), and concludes that an astrology which:

did not yield substantial proof in scientific terms, could still be a practice susceptible of being evaluated by individuals in their own experience – and potentially – judged to work, to be useful, and therefore to be true (pp.307-308).

In other words by defining "true" as "useful" (ie seems to work), astrology is made to be true.

Coherence (truth is what is consistent with other truths)

Coherence depends on what is being cohered (is it astrology in general or just particular kinds of astrology?) and what it is being cohered with (is it science, myths, religion, pseudoscience, new science such as quantum mechanics, or divination?).

Astrology-as-divination involves "an ongoing dialogue with more-than-human agents", whereas astrology-as-science "typically involved the exclusion of subjective mental factors" (p.205). Intuition – including psychic ability and extra-human agents – is often seen as essential, but Phillipson notes that *psychic* is not the same as *extra-human*. The first reduces to information retrieval (so there can be no objection to testing astrologers), the second to a chat with gods and spirits where "the provision of information may not be the primary function of the exchange" (p.215), in which case testing has little to test because everything is subjective.

Comment But what if it isn't, as in Where is my cat? Which person committed the crime? *Psychic* and *extra-human* are then both testable. Phillipson cites a psychologist who in the 1950s consulted the I Ching twice on the same question, where the second answer seemed to scold him for asking twice (p.230). If replicated it would overturn much of science – surely an opportunity not to be missed. But instead of getting people to consult the I Ching twice on the same question, Phillipson stays with N=1 and cherry-picking. Thus "There is a considerable body of research to support the existence of paranormal phenomena or psi" (p.212), for which he cites two positive reviews (Uttis 2016 and Radin 2018) but with no hint of the considerable problems that have always existed (think of casinos).

To support extra-human effects Phillipson cites Radermacher's thesis (see 7.2.2011.1); and Brockbank's 2011 thesis *The Responsive Cosmos: An Enquiry into the Theoretical Foundations of Astrology*, which concludes that astrology is (1) neither true nor false but "aims at astrological truth" (p.202), ie allows extra-human agents in the cosmos to help chart readings, and (2) "is not subject to empirical verification, is nonfalsifiable and is not directly concerned with accuracy" (p.212). So Brockbank feels a responsive cosmos is "more a matter of belief" (p.194).

But is astrology-as-divination coherent? If it worked purely via psychic ability, planets would not be needed and astrology would be redundant (p.233). But there is coherence to the extent that astrology (as in other areas such as religious faith) "would be beyond the competence of scientific methodology" (p.251). So yes, astrology-as-divination is subjectively true.

Failure of dialogue

Other than truth, Phillipson's prime focus is what he calls a "failure of dialogue". Astrology is "a maelstrom of incompatible ideas" (p.71). Dialogue has failed due to different views of truth.

Comment But is that the real reason? Rather than look at the *results* of tests (eg did they use controls?), Phillipson looks at *opinions* about tests, using them to develop philosophical views that most researchers would see as irrelevant to practical issues, see Weinburg in 7.2.2017.3. For example when *Astrology in the Year Zero* was published, astrologer Dennis Elwell was disappointed by the way the astrology/science issue had been handled (Dean et al's views were "irredeemably flawed") and had his own views posted on Phillipson's astrozero website. At the time Elwell was the only complainant. In response, Phillipson:

offered to curate a dialogue between Elwell on one side and Dean et al on the other. This resulted in a series of eight articles, amounting to more than 130,000 words in total (p.29). See www.astrozero.co.uk/astroscience/elres.htm.

Phillipson describes the exchange as "embodying a failure of dialogue" (p.30). But calling it "a failure of dialogue" effectively hides the real problem, which is:

Elwell's style, which is marked by unsupported assertions and ad hominem attacks in lieu of scholarship. If he says X is crucial he typically fails to explain why, or resorts to jibes, so readers have no clear way of deciding whether X is a reasonable point. Unlike us, he makes no attempt to list issues to facilitate discussion or to summarise arguments to facilitate progress. He tells us we are doing it wrong but not how to do it right. He tells us astrology should be tested on its own terms but not what those terms are. Negative studies are dismissed as sloppy but sloppier studies (if positive) are accepted. He never simply reports what we did but has us blast, boast, chant, cry, dupe, posture, savage, sneer, sniff, snort, smile, whinge, or issue diatribes. We came to these exchanges in good faith but were not met in kind. (Abridged from "Researchers respond to Elwell" on www.astrozero.co.uk/astroscience/elres.htm).

So the problem here was not so much a failure of dialogue as a failure of Elwell to properly engage in dialogue. The interchange never had a chance to be constructive.

Also Phillipson's summary of the Ertel-Dean dispute about Gauquelin social effects gives Ertel's views at length (p.134) but entirely ignores Dean's response to each of Ertel's points as listed in 6.13.3. The same cherry-picking applies to: (1) His treatment of the Carlson tests, where only the (questionably) positive tests involving the CPI are mentioned (p.146) and not the negative test involving astrologers, see 7.6.1986.2. (2) His summary of Vernon Clark vs meta-analysis (p.147), which is seen as resting on "a model which effectively discards positive findings on the basis that they are infrequent" (p.148). But the discrimination involves sample size and their associated sampling errors, see 8.6.4, so his argument does not apply. (3) His summary of Roberts and Greengrass's work on time twins quotes only one side of the story and ignores the work on cohorts in 8.7.10, available to him in *Tests of Astrology*. (4) He claims that supporters (like us) of the factual correspondence approach to truth insist that only our kind of truth applies (p.113). But as *Tests of Astrology* 11.4 and the present book confirm, we do not insist on such insistence, and are ready to allow people to believe anything they like, see 11.11. (All of the above is in fine print to save space)

The above cases (there are others) are precisely where we expect Phillipson to get the details right before philosophising. Isn't this a bias his supervisors (Campion and Curry) should have corrected? Moreover, since views can legitimately differ, why should *dialogue* be expected to deliver rather than controlled tests unless it avoids bias and clears up misunderstandings?

When a situation is poorly understood, as astrology was in the 1970s, a wide range of possible accounts can be advanced usually with much disagreement. But no amount of philosophising will resolve poor understanding. Indeed – and this is where Phillipson's focus is problematic – no progress was possible until tests could decide between opposing accounts. Thus the nature of astrology remained enigmatic until tests made it possible to see if "astrology works" meant it needed to be true, and whether its effects were better explained by artifacts than by extra-human agents or *as above so below*. Reject testing and we are at the mercy of speculation.

Phillipson's thesis repeats the main suggestions made in his 2006 Correlation article – we live in an interactive universe that we can converse with by divination. So astrology boils down to a useful medium for such conversation and acts by providing metaphors. It doesn't matter if the metaphors (eg *Uranus is change*) have no empirical support because acceptance is enough. As pointed out by the British philosopher WJ Thomas (1863-1947), "if men define situations as real [then even if not real] they are real in their consequences". **End of comment.**

Conclusion

For astrology-as-science, Phillipson concludes "there is little basis to judge the practice true" (p.321). He doesn't discuss whether it should therefore be discouraged or even condemned.

For astrology-as-divination "it is philosophically defensible for an individual to assert that, in their experience, astrology works; and on this basis, to consider that astrology is true" (p.321). But he recognises that the same argument could be applied to almost anything from the flight of birds to fortune cookies and tea leaves, even though the complexity of astrology potentially allows more scope for it to work in seemingly mysterious ways.

Phillipson claims "astrology is sufficiently mysterious and multi-faceted that we need to be cautious" (*Correlation* 25(1), 55, 2007), but doesn't notice that astrology can work in entirely non-mysterious ways by people mistaking artifacts for actual effects (the superprize tried to disconfirm this view but failed, see 8.9.10.2). Which was precisely Mather's evaded point.

In summary form, Phillipson's conclusions are:

		Does astrology deliver that kind of truth?	
Kind of truth	English translation	Philosophical argument	Conclusion
Pragmatism	It works	Philosophically defensible	Yes confirmed
Correspondence	It fits the facts	Not definitely resolved	No not confirmed
Coherence	It fits eg religion	All are beyond science	Yes confirmed

And his conclusions for astrology-as-science vs astrology-as-divination are no different:

Astrology	Involves	Philosophical argument	Conclusion
As science	Factual evidence	Objectively unsupported	No not confirmed
As divination	Personal experience	Subjectively supported	Yes confirmed

For comparison the conclusions obtained via the tests in the present book are:

Test

Effect size vs factual claims
Birth charts vs meaning

Controlled observation

Nowhere near commensurate
Works even with wrong charts

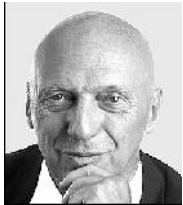
Conclusion

) Astrology does not
) need to be true

which are essentially the same as Phillipson's except they are evidence-based and remain unambiguous regardless of the meaning of truth. But his own argument against the claim that "testing is the best tool for telling the real from the imaginary" reduces to interpreting *real* as *subjective*, ie effectively *imaginary*, so the argument is circular. It supports the cynical view that philosophy contributes more noise than signal to the study of astrology. But at least our conclusions are in broad agreement otherwise we might both be facing more decades of work.

7.7.2019.2 The best proof of astrology since Gauquelin?

Vincent Godbout. Presentation to the 2019 Kepler Conference where it was hailed as the best proof of astrology since Gauquelin. It claimed to demonstrate a match between birth charts and character as measured by the French school of Characterology. In 2006 Godbout retired as professor of mathematics at the Collège Montmorency in Laval, Quebec.



Working in French, Godbout compiled from 25 famous astrological authors (variously from Canada eg Hirsig, France eg Barbault, Germany eg Ebertin, the UK eg Hone, and the USA eg Hand) a list of 2881 unduplicated keywords for planets in signs, aspects, and midpoints, representing 5148 different sign-aspect factors + 848 midpoints = 5996 factors in total. He does not give the mean keywords per factor but for 12 typical factors it was 21.7, range 14–55.

Orbs were 10° for 0,180 aspects down to 3° for 45,135, 2° for midpoints or 1.5° if indirect. For 10 planets and Asc (his use of the MC is unclear), the mean number of factors per chart is about 23, plus twice this for midpoints (*Recent Advances* 1977:293). To simplify computer processing nothing was weighted. So NE-60-PL orb 6° had the same weight as SO-0-MO orb 0°.



Godbout compared the resulting keywords per chart with 244 historical character profiles from *Traité de Caractérologie* 1945 by philosopher René Le Senne (1882-1954) who classified them yes/no on these dimensions:

- *Emotivity/Unemotivity* (found later to be related to neuroticism or **N+ / N-**).
- *Activity/Inactivity* (found later to be unrelated to anything definite, see comment).
- *Primarity/Secondarity* (found later to be related to extraversion or **E+ / E-**).

To make the comparison Godbout converted each dimension to trait words as given by French books of characterology. The totals were:

Emotivity 133 / *Non-emotivity* 51 • *Activity* 93 / *Non-activity* 89 • *Primarity* 101 / *Secondarity* 108 • Mean 96.

For example the 108 trait words for *Secondarity* included precaution, organization, concentration, analysis, austerity.

Each of the 100 or so trait words for each of the 244 cases was then compared by computer with the many hundreds of keywords per chart, and the same for a control group of 10,000 random charts during 1800-2010. For example:

"anxiety" is a personality trait that belongs to the "emotivity" factor. Therefore I measured the strength [ie proportion] of "anxiety" in the control group and compared it with the strength of "anxiety" in the group of emotionals.

The worst performing words were then progressively eliminated from the top 30 or 40 trait words until he had typically 18 that gave the best results in 2 x 2 tests of cases vs controls. For example here are the results for Primarity and Secondarity (essentially **E+** and **E-**):

	Hits	Misses	Total	p by chi ²	Tested with opposite keywords*			
					Hits	Misses	Total	p by chi ²
Primarity (E+)	79	39	118		36	68	104	
Controls	5174	4826	10000	0.0010	5174	4826	10000	0.0005
Secondarity (E-)	76	28	104		48	70	118	
Controls	5000	5000	10000	0.000003	5000	5000	10000	0.044

*eg E+ subjects tested with E- keywords, so hits should be less than misses. And they are.

All results including those not shown here were highly significant. So Godbout concludes:

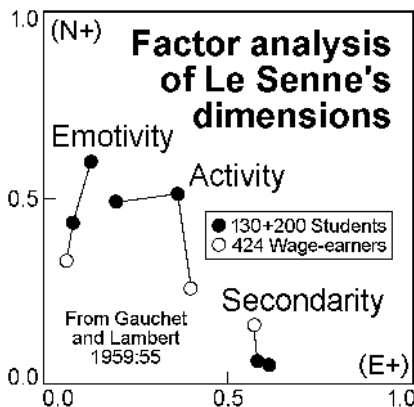
It seems that my old dream of establishing the validity of astrology in a completely automated way is coming true, leaving no room for an explanation of possible results by "psychic" hypotheses such as clairvoyance or ESP, which have a better reputation among scholars than astrology which is so despised in academic circles.

Comment Despite Godbout's impressive computer programming his study has problems:

(1) French Characterology and its traits were not derived by modern methods and are now relegated to the archives of history. Thus the 1023-page Larousse *Grande dictionnaire de la psychologie* 1999 says:

The most common characterology in France is that of G Heymans and E Wiersma (1909), taken up by R Le Senne (*Traité de caractérologie*, 1945) but fallen into disuse due to its lack of theoretical and methodological rigour (p.133).

The same is true of the many dozens of personality theories that existed in the 1950s before factor analysis eventually sorted out the whole mess. Thus to derive Le Senne's 3 dimensions the Dutch psychologists Heymans and Wiersma used 2500+ questionnaire responses.



But later factor analysis by French psychologists Gauchet and Lambert (*La Caractérologie d'Heymans et Wiersma* 1959) of 754 questionnaire responses revealed only two underlying dimensions, here labelled with their nearest equivalents N (neuroticism) and E (extraversion), which generally emerge in all kinds of early personality tests and even in ancient Greek ideas, see 7.6.1985.1. The position of each dot shows its correlation with each dimension. Emotivity and Secondarity were largely consistent across data sets (dots are close together) and were also largely independent (dots cling to different axes). But Activity was less consistent and tended to overlap the other two. So the authors concluded "the Activity being considered by the French School of Characterology is therefore a broad and complex notion to which the other two basic factors are linked" (p.61).

(2) Similar problems were confirmed by the Dutch psychologists Doddema-Winsemius and De Raad (*European Journal of Personality* 7, 283-298, 1993) who factor analysed the teacher-ratings obtained by Heymans and Wiersma from 54 Dutch high schools (students aged 12-18). They didn't find the claimed three dimensions, only confusing blends. In particular the traits said to define each dimension did not group together as they should. The authors concluded:

the three Heymans [ie Le Senne] dimensions cannot unequivocally be identified in the adolescence data set (p.283).

In other words the traits do not have the validity required by Godbout's analysis.

(3) Consider Godbout's test of anxiety. Because anxiety is part of Emotivity, its occurrence in that group is guaranteed, in the same way that the occurrence of red apples in a mixed bag of red and green apples is guaranteed. In effect Godbout is testing X-ish people to see if they are X-ish, so he gets out what he puts in. So the results tell us nothing about astrology.

(4) To the extent that astrologers (eg Charles Carter in his classic books *Astrological Aspects* and *Encyclopaedia of Psychological Astrology*) base their interpretation of factor X on what is known about famous people whose charts contain X, comparing famous people with keywords based on such interpretations of X is merely a circular process. Its success is unremarkable.

(5) His selection of trait words to give the most significant results is effectively cherry picking. Which is made worse by uncertainties in French-English translation (see 7.5.1997.1), the unexplained use of a thesaurus, the use of signs whose dubious validity reduces even further the measurement reliability, and the failure to use factor analysis and cite relevant research.

(6) Regardless of the above problems, the approach is doomed to failure. Recall that the aim was essentially to show that birth charts give accurate answers. The most direct approach is to have astrologers make judgements they are confident of making and count the hits, as in 8.6. It directly compares the chart with observed behaviour. Indeed, Alan Leo was doing this more than a century ago, see 5.8. Now look at the comparison involved in Godbout's approach:

----- Comparison for each subject -----

Characteristic: Not an E score as confirmed objectively by modern factor analysis but over 100 trait words via subjective 1940s French characterology.

Chart: Not actual judgements by astrologers but merely many hundreds of keywords from unweighted chart factors. Keywords are various astrologers' subjective opinions biased by hidden persuaders and none usefully confirmed by empirical tests.

In other words Godbout's approach merely injects a huge amount of noise on to what direct tests have shown to be a likely non-existent signal, thus greatly increasing the opportunity for finding an effect where none exists. The computer programming is impressive but to hail the results as the best since Gauquelin or to see them as meeting the claimed Kepler conference aim of "holding astrology to the same high standards as in any other field" is to invite ridicule. It needn't have been like this, and one might wonder why it wasn't. Indeed, a hostile critic might dismiss Godbout's study as a classic example of a researcher ignoring relevant research.

7.7.2020.1 How not to meet the burden of proof

Robert Currey, Guest Editorial "The evidence accumulates but proof is never possible" *Correlation* 32(2), 5-12, 2020.

Currey begins by pointing out that it is reasonable to accept that "the burden of proof falls on the claimant" because everyone understands what is meant, even though proof, as strictly defined, is possible only in mathematics, eg $4/2 = 2$ and $\neq 3$. He continues:

But then the burden of proof also falls on the sceptic who dismisses astrology. ... Remarkably, in every case where the raw data can be analysed retrospectively, the results have favoured astrology! This applies to the various sceptical groups who tested the Gauquelins' claims (Ertel & Irving 1996), the Carlson Test (Ertel 2009, Currey 2011), and on Dean's Extraversion and Neuroticism experiment (Currey 2017)" (p.6).

Apart from **(1)** Currey's selection bias (contrary cases exist, eg 7.6.1992.3), **(2)** the mismatch between Gauquelin's claims and astrology (no effect for five planets including the Sun see 6.8.1), and **(3)** his interpretation of the last two (compare 7.6.1986.2 and 7.6.2017.1), to shift the burden of proof is absurd because it would require evidence that nothing like the claim could exist, which is not possible. Lack of evidence for X does not disprove the existence of X.

Which is why the **burden of proof** is always on the person asserting a positive claim, not on critics to disprove it. The claimant must always provide enough evidence to make the claim worth investigating. If tests then show that the evidence cannot be replicated (so the results can be dismissed as a fluke), the claimant has to improve the evidence.

But when is **evidence** sufficient? US psychology professor Theodore Schick (*The Skeptic Encyclopedia of Pseudoscience* 2002:327-333) suggests that evidence is sufficient to support a claim when either **(1)** the claim provides the best explanation of the evidence, or **(2)** the evidence provides the best explanation of the claim (p.331). Suppose claim = *astrology works*, and evidence = X. Does astrology works provide the best explanation of X, and does X provide the best explanation of astrology works? If X = *daemons* then the answer is No because one mystery is being explained by another. Instead of helping our understanding it hides our lack of understanding. But if X = *known artifacts* the answer is Yes because we get clarity instead of mystery. Of the two X's it is the better explanation of why astrology works.

But how to judge an **explanation**? There is no simple way. If a case is borderline, people could reasonably disagree. But most cases are clear-cut so disagreement is not an option. Thus the exact point at which daemons become artifacts cannot be precisely defined but the distinction between them is as objective as it comes. So is an observed *tiny* effect size enough to explain a claimed *large* effect size? Obviously not. Only a large effect size will do.

Against this Currey appeals to the power of **replication**. He points out that Gauquelin's planetary effects have been independently replicated, a point we stress in 6.6.1. Therefore:

It doesn't matter that the Gauquelin results have survived without a plausible alternative explanation even after half a century. ... The probability that the Gauquelins' results occurred by chance are [sic] impossibly low. However, critics such as Geoffrey Dean now claim that the effect size is so small that there must be an artefact. To counter this, a small

effect size in large samples is more persuasive than a large effect size in a small sample (p.6).

There are five problems here. (1) Gauquelin's earliest results have a plausible explanation, ie astrology doesn't work, see 6.3.1. (2) His planetary effects have seven proposed explanations, see 6.8.2. (3) Replication does not make the outcome free of artifacts, thus self-attribution artifacts replicate but not actual sun sign effects, see 8.3.7. (4) Dean does not make the stated claim, only that the presence of social artifacts is confirmed by tests that replicate, see 6.10 ff. (5) A small effect size remains small and unpersuasive regardless of sample size.

Currey then asks "Where is the evidence?" and gives this reply:

I often review studies from new researchers. Sometimes, the authors are convinced that their study will prove astrology "once and for all". But just as frequently, their results are undermined by a Type I error [falsely concluding an effect exists]. This can be, for example, an artefact (non-astrological effect). So, it takes a lot of filtration to find studies that provide solid evidence. ... Just as proof is not possible in scientific fields, astrological research is no more than testing claims and providing evidence. Over the past fifty years, scientists and astrological researchers are discovering a growing body of objective evidence of correlations between celestial positions and terrestrial life. These statistically significant results have been published in peer reviewed journals and set out in the Evidence List (pp.6-7).

His **Evidence List** (pp.9-12) consists of 78 references to:

some of the experiments in the last 60 years [it was only 50 above] that support the fundamental notion of astrology: that the position and movements of celestial bodies correlate with life and physical processes on Earth. If we exclude Gauquelin replications, [and] studies relating to physical health or animal behaviour just over half these studies relate to the practice of astrology (p.9). [But if half do not, why include them?]

Given that hundreds of studies are documented in *Tests of Astrology* (which Currey quotes on p.8 but then ignores) and a thousand in the present work, plus countless more if the field includes physical effects such as people getting up at sunrise, to pretend that just 78 studies provide a "growing body of objective evidence" is ludicrous. It is cherry picking, the selection of good cherries to prove that a tree with mostly bad cherries is OK, so it gives a biased picture of the evidence base. In science anyone who adopted this approach would soon lose their job.

It gets even more ludicrous when the Evidence List is examined. If we reasonably expect the fundamental notion of astrology to involve astrologers reading charts for clients, only five of Currey's 78 studies are relevant, yet arguably at least 126 (69+22+35) exist, see 8.6 ff.

Again, of those five, the second is a reprint of the first, so there are only four unique studies. One by Vernon Clark is problematic due to large sampling errors, see 8.6.4. Two ignore the artifacts identified in *Tests of Astrology* (in the present book see 7.6.1986.1 and 7.6.1986.2 comment 2). And one is a German test of agreement (not accuracy) among 80 astrologers judging 50+ charts, the mean being a useless $k = 0.10$, see 7.6.1979.3.

Similarly 19 of Currey's 78 studies involve lunar effects, yet hundreds exist, all characterised by outcomes that are as frequently negative as positive, see 8.5.5, and (until astrological consultations are routinely scheduled by moon phase) all of dubious relevance.

Of the remaining 54 studies, 14 are on Gauquelin planetary effects quoted but rarely used by astrologers. 14 are by Tarvainen who puts statistical significance before practical significance, which allows him and Currey to mislead readers as in "very clear significance" when in fact nothing of practical value is happening, see 7.7.2016.4. And some of the rest fall apart when scrutinised, eg dancers 7.6.1984.2, twins 7.6.1992.3, work injuries 7.4.1993.1, conception 7.4.2005.1, dogs 7.6.2007.1. Conclusion: the claimed **solid support** does not exist.

The way out of this mess is of course a funnel plot of all studies so the message is clearly discernible. Except that Currey has dismissed this approach as using effect sizes to hide the importance of statistical significance, see third page of 7.7.2018.1, when in fact it extracts what matters – practical significance – and displays it in a way everyone can understand. The gold-standard Cochrane Collaboration in medicine relies on it, as do many areas in science, see 8.2.4. But not in astrology. After all, why have clarity when you can have confusion?

There is no charitable way of describing this. To claim that the Evidence List provides solid support for astrology is grossly misleading. Critics looking for (1) examples of astrologers who shoot themselves in the foot, and (2) reasons to dismiss astrology, need look no further.

7.7.2020.2 Researching astrology via inutility and N=0

Glenn Perry, A brief introduction to qualitative research in astrology. *Correlation* 32(2), 63-68, 2020.

Perry claims that quantitative research (narrow focus, few variables, many cases) is ill-suited to astrology as practiced, whereas qualitative research (holistic, many variables, few cases) is ideally suited, and in fact formed the early basis of psychology:

Psychologists such as Freud and Piaget used observational qualitative methods to form their theories, which continue to be major cornerstones of contemporary psychology (p.63). [But that was then, when quantitative methods were in their infancy. Today qualitative methods are seen as useful for generating ideas for quantitative testing rather than as a stand-alone approach, see 4.4.2.] Likewise, in astrology we have accumulated an impressive body of knowledge over the centuries through simple observation and correlation (p.63). [Contradicted by the evidence in Chapter 3.]

Qualitative research in astrology addresses questions like "what do people feel during their Saturn return". Quantitative research addresses questions like "to what extent do Saturn aspects affect marriage", which tells us nothing about the subjects' actual thoughts, feelings, beliefs and values (p.67). The advantages of qualitative research are:

- Compatible with astrological worldviews and therefore more likely to yield meaningful results.
- Eliminates risk of research producing outcomes that appear to invalidate astrological practice.
- Allows astrologers to re-visit their roots, ie ask questions, gather data, analyse results, get answers (p.68).

Comment After this build-up readers look forward to examples of qualitative studies that convincingly support Perry's claims. But none are given (N=0). Discussion remains abstract. There are no specific suggestions for likely topics, how to do proceed, and where to report outcomes. Readers are left none the wiser. They are told there are 40+ studies that support astrology (p.68 endnote 1), but not that they are quantitative and dubious, see 7.7.2020.1. Didn't *Correlation* notice this inutility? For a qualitative example see 7.6.2000.1.

7.7.2020.3 Researching topics that are bound to fail

Peter Fraiss, Suicide and birthtime. *Correlation* 32(2), 43-53, 2020. Based on his 2017 BSc dissertation in psychology at the Sigmund Freud University in Vienna. *Correlation's* guest editor was "impressed by his thoroughness" (p.7).

Fraiss compares 617 suicide cases with 1324 non-suicides, all born 1900-1985 but otherwise unmatched as they should be in a study like this, which Press et al were careful to ensure in a classic study not cited by Fraiss, see 7.4.1977.3. He concludes that the inevitable differences between their signs and aspects, although significant, do not necessarily relate to astrology. "All that is certain is that the results cannot be ruled out as random statistical data" (p.52).

Comment But the same conclusion can be reached without leaving your armchair. Imagine you are an astrologer determined to prove your ability to detect suicides and murder victims from their birth charts. Also imagine you are ignorant of Nona Press's suicide study and the data below for the number of global deaths in 2017 when total deaths was 56 million or 107 every minute or $60/107 = 0.6$ second apart. Data are from www.OurWorldinData.org:

	Deaths millions	vs All deaths = 1		Deaths millions	vs All deaths = 1
	-----	-----		-----	-----
All deaths	56.00	1	Homicide	0.41	138
Cancers	9.56	6	Drowning	0.30	190
Dementia	2.51	22	Conflict	0.13	432
Diabetes	1.37	41	Fire	0.12	464
Road injuries	1.24	45	Terrorism	0.03	2120
Suicide	0.79	71	Disasters	0.01	5830

To prove your ability, you calculate birth charts for the 71 deaths that occurred 0.6 second apart and pick the suicide. But data for their 71 births is not knowable, nor are death times

precise to 0.6 second (except maybe for a suicide bomber and victims). Obviously it cannot be done. The same goes for murder, other deaths, and indeed anything else you can think of.

As time goes by it gets worse. In 2020 expected global births totalled 130 million or 250 every minute or $60/250 = 0.25$ seconds apart. Which does not deny that, some day, astrologers could discriminate between birth charts 0.25 seconds apart. Yes, there will be a difference if the birth places are far enough apart geographically. But are you holding your breath?

7.7.2020.4 How involved was astrology in the history of science?

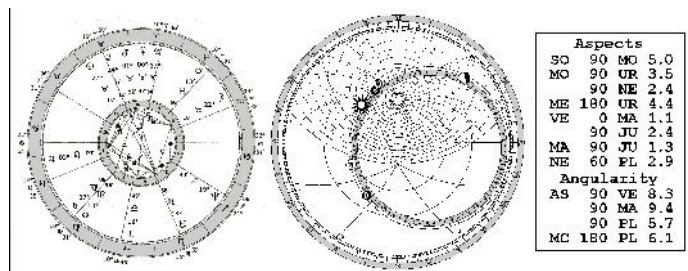


Alexander Boxer. *A Scheme of Heaven: Astrology and the Birth of Science* 2020 (UK title, which differs from the pictured US version) 320pp. A "scheme of heaven" is William Lilly's term for a birth chart. Boxer (a data scientist with a PhD in physics and degrees in the history of science and the classics) explores what he sees as astrology's crucial but little-recognised contributions to the growth of science. One might question his untangling of the astronomia-astrologia-mathematicus equivalence in favour of astrology, and his failure to cite previous works that explore astrology's contributions such as Berlinsky's *The Secrets of the Vaulted Sky* 2003 and Bobrick's *The Fated Sky: Astrology in History* 2006 ("the history of science itself is so beholden to astrology that it owes it a debt of respectful attention if not abundant gratitude" p.13) and many others that note astrology's impact on history. But along the way he retrieves fascinating stories that have attracted rave reviews. Here we focus on the very few tests he presents.

Boxer's aim is to explore astrology, not endorse it. If he or his associates meet a predictive model that seems especially dubious, "it's not uncommon for us to describe it as 'basically astrology'. This is never meant as a compliment" (p.253). So he suggests that astrology:

is best regarded as a flavour of self-help, one focused primarily on personal and spiritual growth. This is all fine and good, and certainly one big advantage of making purely subjective pronouncements is that they can never really be "wrong". But astrology occupies the spiritual high ground only at the high cost of abandoning its original domain of expertise, namely, making objective predictions about objective events (p.248).

Which to anyone like Boxer with a training in science prevents any hope of understanding how astrology works. But he does try, for example by giving the birth charts for about a dozen key events in history such as the founding of Bagdad and the birth of Henry VIII, albeit in a classical astrolabe style unfamiliar (and barely useful) to most astrologers:



Left, Boxer's birth chart (16:20 UT 18 May 1979 Tucson AZ) in standard format (p.247). Centre, in classical astrolabe format (p.143) with the seven classical planets. Outer circle = terrestrial view above the horizon, inner circle = ecliptic positions. Both formats make it hard to evaluate aspects and angularity (**right**), which to Kepler were the only factors worth having (p.227). Astrologers might wonder at so many hard aspects.

But away from historical stories Boxer is less familiar with topics of interest to researchers, as when he tells us the Mars effect has not been independently replicated (p.251), and his most recent reference to Gauquelin's work is dated 1990 (p.298). This is curious because he cites *Tests of Astrology* (p.255), which would have updated him, except he dismisses it because:

most of these tests are indirect. They demonstrate primarily that professional astrologers can't do what they say they do, not so much that astrology itself is invalid (p.255). [Unaccountably he cites the compilers' names incorrectly (p.299), giving middle initials not in the book itself, so critics might well ask if he had actually read it]

Indeed, his own research is no better. For example he has a (female) time twin born within eight minutes in the same hospital who shares his interest in physics and Roman antiquities, went to the same university, and wrote a book that led to his own "through a series of unlikely connections" (p.132). He comments:

Of course, if someone asked, I could just as easily make a separate list of all the ways [our lives] have been very different. So, have the stars been guiding our paths or haven't they? ... Statistically speaking, a sample size of two ... isn't enough to reveal anything more than a few curious coincidences (p.132).

He does not let on that various studies of time twins exist, so his argument seems overstated. It suggests only that his book will have limited interest for the working researcher, a point unfortunately confirmed when we look at the tests he does make:

Boxer's tests of astrology

He makes a handful of sun sign tests, most of them simplistic tests of occupation such as 113 supreme court judges (p.87), >1200 national UK soccer stars (p.90), and 977 olympic sailing medalists (p.91), all of which give non-significant results by chi-squared tests ($df=11$) made without recognising the need for demographic and astronomic corrections (he does not report the corresponding p values but they are 0.52, 0.12, 0.82 respectively).

On the other hand he shows how relative age effects (ie age incidence) dominate sports that rely on competitive youth leagues with strict age cutoffs. His description is stunningly clear:

The most extreme case is hockey. Junior hockey leagues typically group players together according to the calendar year of their birth. This means that a player born on January 1 will be almost a year older than his teammate born on December 31, even though both belong to the same age cohort. For players who are nine or ten years old, that difference represents an enormous developmental advantage, both physically and mentally. And since only the best players from any given year are likely to continue on to the next level, the cumulative effect is a system that progressively weeds out [the most affected signs] even before these players ever reach the pros. And the end results are striking (pp.89-90). [Here he quotes 7417 professional players in the US National Hockey League whose sun sign distribution shows a "very significant departure from uniformity" (p.90). Again there is no p value and no concern for demographic or astronomic effects, only a chi-squared value of 143.8, $df=11$, for which $p = 10^{-24}$]

Boxer points out that some (unidentified) studies have uncovered many other biasing artifacts that "ripple down through our lives" (p.90). Therefore, whenever he makes a point with data:

I try to keep in mind the maxim that "If you need to use statistics, you probably should have designed a better experiment." In other words, for a truly compelling result, the data should tell their own story, one that leaps from the page without any complicated analysis (p.90). [A view all astro researchers could benefit from but seldom do]

Tests of Guido Bonatti

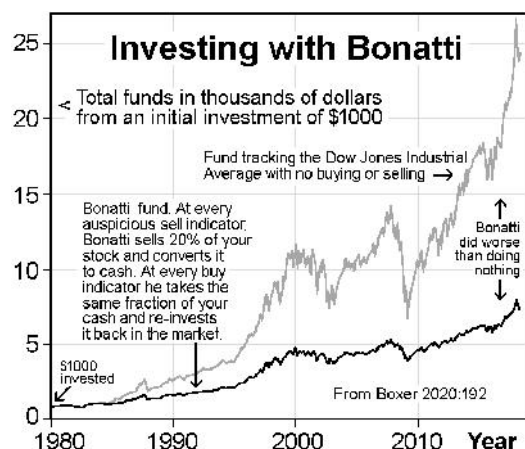
Boxer describes a test that meets this requirement based on Italian astrologer Guido Bonatti's 1491 book variously translated as *Ten Treatises on Astronomy* which, despite its name, was solely concerned with predicting terrestrial affairs in response to horary yes/no questions. It was the most influential astrology book of the Middle Ages and remained in circulation for centuries (p.182). It sounds authoritative and empirically sound, but there was a snag:

the astrologer would determine the stars' judgment based on their positions in the sky at the moment your question was asked. In other words, the key celestial instant had nothing to do with the matter at hand. It was simply when-ever you and your astrologer had managed to schedule an appointment. This arrangement was undoubtedly convenient for the professional astrologer wishing to keep regular office hours. But I think I can speak for most twenty-first-century readers when I say that as a means of forecasting the future, it sounds totally nuts" (pp.181-182).

In *Ten Treatises* Bonatti gives his cookbook rules for getting answers to hundreds of different questions, some deadly serious like whether to risk battle with an enemy, some personal like

the chance of recovery from an illness, some trivial like how long a banquet would last. So "according to Bonatti, the stars in their majesty had answers for each and every one of these pressing concerns" (p.183).

Bonatti also gives cookbook rules for finding the best moments to buy and sell for profit-making purposes. "Identifying the dates flagged by Bonatti's buy and sell [rules] therefore becomes, at least in principle, a reasonably straightforward affair" (p.189). But "whatever gains you may have realised by investing in the Bonatti Fund (cash and stock combined) are dwarfed by what you could have achieved simply by never selling" (p.191). Bonatti's curve heads upwards only because the stock tends to increase anyway between buying and selling. So these particular Bonatti rules fail to work.



Human limitations

Boxer suggests this failure might be due to human limitations on fitting complex data to complex affairs, where machine-learning neural networks can do a much better job. For example he shows how they can exactly fit *simple* daily planetary sign positions to *complex* variations in the price of Bitcoin, albeit only because:

"The model we've trained is so big ... that it's essentially able to learn a separate relationship for each individual data-point without discovering any meaningful underlying pattern. ... what's implied is that if we were to sample more data – for instance next year's prices – the correlation would quickly fall apart" (p.252). Nevertheless "Maybe with the benefit of larger data sets – and using tests not unlike the ones we've applied throughout this book [like miscalculated chi-squared?] – the results may one day even be as clear as a geometric proof" (p.256).

But he fails to do what he should have done – test a Bitcoin model based on half the data against the other half – which must surely raise suspicions about his promotion of astrologia before astronomia and mathematicus, not inconceivably in the interests of book sales.

Boxer's closing comments emphasise the role of wonder:

At stake is not so much which truth is true, but where we should seek our wonder. To acknowledge science as a source of wonder is to acknowledge, implicitly, a profound debt to history ... if we cannot faithfully preserve the knowledge which previous generations have hewed out of bleakest ignorance, then we will squander that wonder for the generations to follow (p.258).

There is an important message here. If astrology is part of a connected cultural whole then it cannot automatically reject all links with an equally culturally-connected science. In other words astrology is multidisciplinary and astrologers ignore science at their peril.

7.7.2020.5 Comparing birth charts with biographies N=41+32

Vincent Godbout. An automated matching test. *Correlation* 32(2), 13-41, 2020. An extension of his 7.7.2019.2 study. Matching tests ask astrologers to match N birth charts with N owners and count the hits, see 8.6.1. Godbout avoids the need for astrologers by choosing famous people as subjects and replacing (1) each chart with a list of chart keywords, (2) each owner with a list of biographical keywords, and (3) the matching test with a computer program that compares (1) with (2) in a total of N x N comparisons to find the best match. Godbout calls his program an "expert system", but it is based on tradition and is not expert in the sense of being based on a database of expert knowledge.

To better understand the technical challenges of biographical keywords some background may be helpful. For most of astrology's history there were no reliable methods of classifying human personality. In psychology this prevented all progress until the 1930s when UK and US psychologists developed factor analysis, a statistical technique for reducing a large number of variables to their underlying factors. In effect it clarified what was actually happening under the usual fog of trait words. Progress was suddenly possible but was mathematically demanding and often heroic.

In 1936 the US psychologists Gordon Allport and Henry Odbert extracted from the 400,000 words in the 1925 edition of *Webster's New International Dictionary* nearly 18,000 (4.5%) personality trait words, which they reduced to 4504 (1.1%) that described the most observable and permanent behaviours. Their list started and ended like this:

abandoned, abject, abrupt, absent-minded, absolutist, absorbent, abstemious, ... zealotypic, zealous, zestful, zetetic.

In the 1940s the British American psychologist Raymond Cattell further reduced the number to 170 by removing synonyms, and then even further for his 16PF inventory by factor analysis of questionnaire responses. In the UK, Eysenck and his associates used factor analysis to sort out the dozens of conflicting theories, and after thirty years achieved success, see 3.4. Today, despite many thousands of factor analytic studies, there is still room for improvement. But advances have been made in structure and in clarifying the effects of situation that would have been unthinkable only decades ago. To date the most popular structural outcomes include the Big Five and Eysenck's Gigantic Three, with many dozens of other outcomes focused on narrower dimensions for particular purposes such as paranormal belief.

This progress was made possible only by armies of researchers using factor analysis. Indeed, to study human personality today without factor analysis would be a retreat to the days of ignorance (see 7.2.1987.2 for an example of how it resolves confusion in astrology). But Godbout's study does not use factor analysis, or proper controls, despite which some astrologers claim his approach is the first major advance since Vernon Clark's pioneering studies of 1960-1961.

By computer Godbout generates **chart keywords** for the signs, aspects and midpoints in each chart from a pool of 6006 keywords extracted from the books of 25 leading astrologers. Houses are not included because they are generally ignored by most users of midpoints. Non-nouns eg *active* are converted into nouns eg *action* to assist later comparison. In this way Godbout ends up with between 124 and 230 different keywords for each chart.



Godbout's **subjects** are famous people with biographies taken from the 100 biographies given in Subtil and Rioux's 2014 book *Le Monde: Les grands portraits*, where each biography is uniform in coverage and of convenient length (those in books and encyclopaedias are either too long or too short). Only those with recorded birth times (source not stated) were used, divided into two sets, those with times rounded to the hour or half hour ($N=32$), and the rest more precise ($N=41$).

Abridged from blurb: A book of 1024 pages with 100 unforgettable portraits by various writers published in *Le Monde* 1944-2011. All are heroes from political, religious, artistic and intellectual circles. De Gaulle is "sublime and intolerable", Churchill "unpredictable and undisciplined". There are artists and writers like Arletty, Jim Harrison, Carl Sagan; dark heroes like Eva Peron, Khomeini, and Depardieu, the thug who became a star.

The **biographical keywords** for each subject are obtained by taking all words from their biography that relate to character and standardising them like chart keywords into nouns to facilitate comparison. The end result is between 28 and 96 different keywords per subject. (To avoid bias the extractions were made before birth data were entered, but of course to be sure it needs to have been made by people ignorant of how astrology might relate to the subjects.)

The **matching** is performed automatically by a computer program that (1) compares each of the N sets of 124-230 chart keywords with each of the N sets of 28-96 biographical keywords, (2) records how many times a word appears in both chart and biography as a proportion of the mean number of keywords. For example for Picasso there were 96 biographical keywords, 152 astrological keywords, and 41 joint appearances, so score = $41/((96+152)/2) = 0.348$.

A chart scores a **hit** if its score with the associated biography is larger than its scores with the other biographies. For 41 subjects with precise birth times the hits (6) were highly significant (binomial $p = 0.00045$), but for 32 subjects with rounded birth times the hits (3) were not significant (binomial $p = 0.077$). Adjusting the astrology gave insight into orbs (Faculty ones were as good as any) and zodiac (sidereal didn't work), all of which were seen as "highly significant ... enables further study of astrology's technical questions" (p.13).

Comment There are many problems. (1) We should ask about the extent to which charts are known to match case histories under controlled conditions. As judged by astrologers they do not usefully match at all, see 8.6.1. We should also ask about the extent to which each chart factor is known to be accurately described by its keywords under controlled conditions. For signs (the most disconfirmed factor in astrology) the answer is zero, and according to the results in this book the others may not be far behind. That the study still proceeds without controls and finds (among other things) that signs are valid is good reason to question the procedure. (2) Without factor analysis Godbout's 6006 chart keywords are impossible to evaluate even before we worry about their known low or zero validity. For example here are the chart keywords for one of Godbert's hits. See if you can guess who the subject is:

Achievement, action, adaptation, addictions, aesthetics, affection, aggressiveness, agitation, ambition, amiability, ardour, arrogance, art, authority, beauty, benevolence, boldness, breaks, brio, caution, change, changing mood, charm, collaboration, comfort, commitment, communication, companionship, compassion, conflict, conversation, convictions, conviviality, cooperation, cordiality, courage, creation, creativity, ... ($N=38$ down, 59 to go).

Obviously nobody could guess with confidence. Nor could they if told it was a US President. Nor could they if told it was either Bush, Clinton, or Kennedy (it was Clinton.) But the computer compared huge clouds of keywords and settled on Clinton. Again no proper controls are made that would allow artifacts to be identified. (3) To the extent that leading astrologers base their interpretation of chart factor X on what is known about famous people whose charts contain X , the comparison of famous people with keywords based on such interpretations reduces to a circular process where occasional success is unremarkable. (4) The matching of biographical keywords to chart keywords will necessarily ignore those chart factors such as

But despite these problems, and despite the well-known uncertainties involved in calculating χ^2 with expectancies less than 5, the calculated effect sizes are among the highest ever observed in astrology, so against all odds Godbout's approach seems amazingly successful:

Except the effect size expected by chance when m random predictors are matched to N random criteria is not the zero we might expect but $\sqrt{((m-1)/(N-1))}$ see 8.2.5. If we use Godbout's means of $m = (28+96)/2 = 62$ and $N = (124+230)/2 = 177$, the expected effect size is $\sqrt{(61/176)} = 0.59$, so those above are nothing special and are not necessarily due to astrology. Our suspicions about the procedure are being confirmed. **End of comment**

abundance	affluence, aise, altruisme, ampleur, argent, benediction, bienfait
abundance	affluence, ease, altruism, magnitude, money, blessing, benefit

Ranks after the first Godbout also counts hits when the subject's chart is ranked 2nd, 3rd, ... 8th out of N vs the subject's biography, which gives 2, 3, ... 8 opportunities for counting hits instead of just one. Increasing opportunities from 1 to 8 (which was also assumed to be the expected frequency) results in a mostly uniform increase in hits, although the advantage of precise birth times over rounded times is often reversed. The p values show no clear trend:

Comment It is hardly surprising that the number of hits increases as the definition of "hit" is widened, but their interpretation is not possible without appropriate controls (here unrelated charts are not good enough because they do not allow each variable to be independently controlled). To fill the gap we ran Godbout's approach on 6000 keywords simulated by two-character strings randomly generated from ASCII character codes from 45 (-) to 125 (}) that

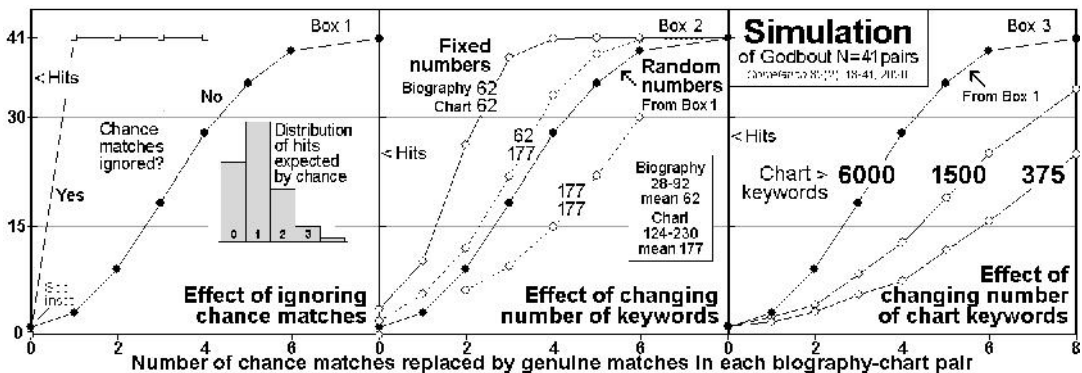
allowed each variable to be varied without affecting the others. The first two steps were:

- Create a pool of 6000 unduplicated keywords from which simulated biographies and charts can be picked at random without replacement for variously $N=28-96$ and $N=24-230$ respectively. By chance the same keyword can exist in both biography and chart but there will be no duplication of keywords within an individual biography or chart.
- Calculate hits as per Godbout for 41 and 32 pairs. Any hits at this stage will be due to chance.

Then comes the simulation of genuine matches:

- Repeat, but each time a chance match between biography and chart is found up to a fixed frequency (0-10), replace it with a simulated genuine match taken from a new pool of 500 simulated keywords, none present in the 6000. Then repeat the calculation of hits. Genuine hits can now be identified and counted independently of chance hits for different numbers of biographical and chart keywords. We can now see what is actually happening.

Here are the results for samples of $N=41$ pairs when each run was repeated sufficiently (many computer hours per box) to smooth out the variations common to all random operations:



Box 1: Here we are replacing chance matches with genuine matches in each of 41 cases, each with 28-96 biography keywords and 24-230 chart keywords both picked at random, to discover the extent to which chance matches interfere with counting genuine matches. When chance matches are ignored (which in reality cannot be done) it needs only one genuine match present in each individual pair to allow the correct matching of all 41 cases, a clear-cut outcome. But when chance matches are necessarily not ignored the outcome is no longer clear-cut: observed hits start at the number expected by chance, then slowly increase as other chance matches interfere with the counting of genuine matches, until 8 genuine matches are needed in each pair before all 41 pairs receive hits. In other words chance matches create much uncertainty. **Inset:** The average number of hits expected by chance can vary from 0 to over 3, so it is unsafe to assume (as Godbout does) that it is always one, which upsets his p values.

Box 2: Here we do the same thing as in Box 1 but with different numbers of biography and chart keywords with typically 15 runs per data point. The results for the range of keywords picked at random in Box 1 (black dots) are close to those for their means (closest open circles). Otherwise there are big differences in hits despite correction for keyword numbers as specified by Godbout. (The results for $N=32$ were effectively in proportion to those for $N=41$.)

Box 3: Here we do the same thing as in Box 2 but decreasing the number of chart keywords from its initial 6000 in three steps, each by a factor of four, which is roughly equivalent to allowing for synonyms or for preferences among biography writers. This increases the interference from chance matches, which means that the number of genuine matches (x-axis) needed to produce the same hits (y-axis) also increases, i.e. sensitivity is reduced, not increased.

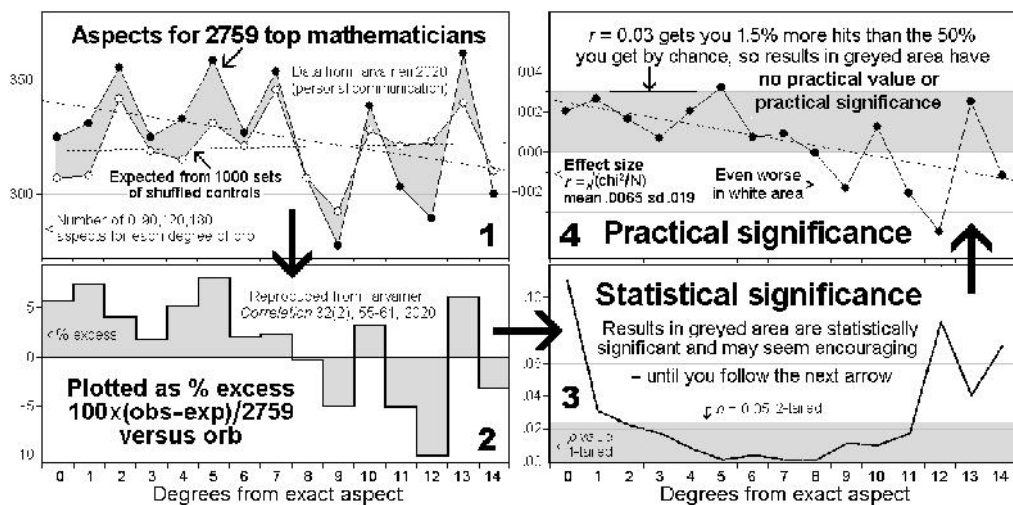
Conclusion The above simulation supports the previous conclusion that Godbout's results are largely due to uncontrolled artifacts. This does not deny Godbout's immense achievements in computerisation. But the outcome is the inevitable result of assuming an uncontrolled procedure involving clouds of assumed-sufficiently-valid keywords could somehow overcome the lessons hard-won from nearly a hundred years of research on astrology and on human personality, which is precisely the problem with his earlier study in 7.7.2019.1.

7.7.2020.6 Statistical misdirection with 2759 mathematicians

Kyösti Tarvainen. Estimation of aspect orbs by the computer. *Correlation* 32(2), 55-61, 2020 and personal communication 2020. Updates his Favourable Astrological Factors for Mathematicians, *Correlation* 29(1), 39-51, 2013. In their 1973 *Astrologer's Handbook* (mainly featuring aspect delineations) US astrologers Frances Sakoian and Louis Acker mention 17 factors favourable for mathematicians that do not need birth times. Seven are Mercury or Saturn in signs. The others are aspects, to which Tarvainen adds 8 aspects favourable for concentration and hard work. The resulting 18 aspects were mostly (in decreasing frequency) 0, 60, 120 and mostly involved Saturn, Mercury, and the Sun.

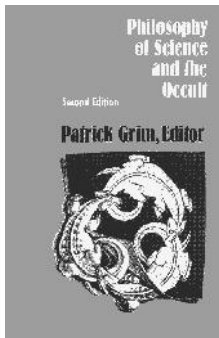
By computer Tarvainen compared the frequency of those 18 aspects in the noon charts of 2759 top mathematicians born 1700–1975 against 1000 sets of controls obtained by shuffling their birth data with the random addition or subtraction of up to 90 days to break repetition of the Sun's ecliptic degree. The results gave statistically significant orbs that were "remarkably close to those recommended by astrologers" (typically 8°), which he felt challenged critics of astrology to explain why orbs calculated by computer "correspond with those determined by astrologers over 2000 years of personal experience" (p.55).

Comment (1) The births of Tarvainen's mathematicians peaked during 1940-1950 at about 40 per year (2013:43) or 1 every 9 days, whereas births in the world's developed regions (Europe, North America, Oceania, Japan) were over 11 million a year (OurWorldInData.org/) or about 300,000 every 9 days. But the tested aspects are too long-lasting to single out the 1 in 300,000 births who were to become top mathematicians. **(2)** Tarvainen's text does not tell us his p values are one-tailed (half the size of two-tailed). Readers who had reasonably supposed they were two-tailed were led astray. **(3)** There is no evidence that 2000 years of experience could have determined anything about aspects and orbs or indeed anything about astrology, see Chapter 3. **(4)** Tarvainen's habitual focus on *statistical* significance (p values) rather than *practical* significance (effect size) is unhelpful. Look at his results this way:



Tarvainen's focus on *frequencies* (top left) and their *differences* (bottom left) and p values (bottom right) does not tell us if the results are useful. When the *effect sizes* are calculated (top right) they are too tiny (none exceed 0.032) to be of practical significance. To put p values before effect size is to lead us astray with statistics. See also 7.7.2016.3.

(5) Tarvainen's studies (and those of others in the present book) seem to assume that nothing could produce apparently positive results except astrological influences, and then do little to explore that assumption. In 1990 EW James, Professor of Philosophy at Bridgewater State University MA, described such attitudes like this:



When astrologers do come upon an interesting consideration in their favour, they make no attempt to develop it – or in Kuhn's terms, to engage in "puzzle-solving". ... possibilities are left unexamined and even unmentioned ... Instead we are told emphatically that astrology has been incontestably demonstrated (On dismissing astrology and other irrationalities, in Patrick Grim ed, *Philosophy of Science and the Occult* 2nd edition 1990:28-36, p.33).

The same applies here – Tarvainen seldom questions the assumption that only astrological influences could produce his results. But as detailed in 8.3.7, roughly 1 in 3 people believe sufficiently in astrology to measurably shift their self-image in the expected direction. Thus to explain hits in census data between occupation and sun sign needs only 1 in 20 of those who have shifted their self-image to have shifted their job preference as well, which does not seem implausible.

Clobert et al (*Personality and Individual Differences* 101, 348-355, 2016) note that the effect of expectations on performance is widely documented and works as a self-fulfilling prophecy or Pygmalion effect. As a check, they tested the effect of reading sun sign horoscopes adjusted to be either positive or negative on three groups of typically 190 people (75% female) aged 17-25. The results were often highly significant ($p < 0.01$) but effect sizes were small (mean 0.06) [unsurprisingly similar to those in sun sign self-attribution, see 8.3.7]. The authors concluded:

Across three experiments, reading horoscopes produced consistent effects. ... Reading positive (versus negative) horoscopes made participants interpret ambiguous stimuli positively (or negatively), perform better (or worse) on a cognitive test, and display greater (or poorer) creativity. [Although] reading positive or negative horoscopes seems to affect everybody to a certain extent, it seems to affect to a greater extent people who believe in astrology and with lower loci of control [ie who tend to see life events as outside their control]. Importantly, these effects of positive or negative horoscope reading were not present after reading other positive or negative news that one may typically find in the same magazine or newspaper. In addition, these effects did not extend to reading any horoscope ... but were restricted to one's own horoscope. It seems clear that reading a horoscope is not a task that produces mere entertainment, but actually affects people's cognition and performance. ... Our main point is that people who are led to believe that their circumstances will be good, will actually make these positive circumstances happen (p.354).

So what looks like astrology may be merely a Pygmalion effect, ie self-attribution. Indeed, *to the extent that astrology's pervasive popularity makes finite self-attribution plausible in all areas of human life, tiny but positive effect sizes (rather than zero effect sizes) should be the norm.*

In 1983 Eysenck had made the same point about tests of psychotherapy that used random controls instead of placebo controls. It was "an almost incredible error of judgment" (*Behavioral and Brain Sciences* 6(2), 290, 1983), simply because placebo effect sizes were comparable with psychotherapy effect sizes. So placebo controls correctly lessened the apparent utility of psychotherapy. The same could apply to tests of astrology that ignore self-attribution.

Back at mathematicians, what number M of image-shifters is needed to give mean effect size $r = 0.0065$ in a sample size of $N = 2759$? From 8.2.4, the proportion of cases (M in N or 1 in N/M) required to give r is 1 in $2/r$, or 1 in 308 , which is very modest compared with the 1 in 60 mentioned in 8.3.7, and extremely modest compared with the typical 1 in 20 for misreporting in the Gauquelin data, see 6.10.1.

In other words we have no reason to take Tarvainen's challenge seriously, because we cannot be sure that $2759/308 = 9$ of his 2759 mathematicians did not shift their job preference due to prevailing astrological beliefs. The same applies to his results generally, see 7.7.2016.4, and to researchers who, like him, use Gauquelin data regardless of its known artifacts.

Conclusion Focussing on the wrong statistics is not only an important first step in leading us astray but also a barrier to understanding. To keep us on the straight and narrow requires effect sizes, proper controls, and replication. If for some reason such an approach seems overly complicated, try the alternative given in 7.7.2016.3, third figure from end.

7.7.2020.7 Saving astrology from empirical defeat $N=0$

Gerhard Mayer. Astrology and Science: A Precarious Relationship. Part 1: Historical review of German astrology. Part 2: Review of empirical investigations of validity. *Journal of Scientific Exploration* 34(4), 771-844, 2020, 168 references. A follow-up to Gerhard Mayer and Michael Schetsche. On Anomalistics Research. *Journal of Scientific Exploration* 30(3), 374-397, 2016, 103 references, who argue that *qualitative* study is the way to reconcile psi's tiny observed effect sizes with their often huge personal impact (ie the problem lies with the *quantitative* study of effect size – for more on qualitative vs quantitative see 4.4.2 – except they ignore the problem that by definition personal stories have no controls to rule out competing explanations). Dr Mayer is a German psychologist with an interest in anomalistics and an evident belief in psi and astrology. His aim here is to correct the ignorance about astrology that exists among astrologers and scientists, to keep questions open on empirical tests that disconfirm astrological ideas such as *as above so below*, and ultimately to make you believe that all is well. The result is a 26,000-word rambling clutching-at-straws review from a believing perspective without a single detailed empirical case to support its claims.

In **Part 1** (historical review of German astrology) Mayer points out that in the 1920s German interest in astrology was then the highest in Europe. Ironically it included attempts (p.774) to blend astrology with science that opposed Weber's 1918 ideas of disenchantment, see 4.3.2.



Especially influential up until the 1990s were (from left) physician and astrologer Herbert Freiherr von Klöckler (1896-1950), psychoanalyst and astrologer Fritz Riemann (1902-1979), artist and astrologer Thomas Ring (1892-1983) (from pp. 775, 777, 779).

Mayer sees Ring (the German equivalent of Dane Rudhyar) as especially important because he developed a complex model in his four-volume *Astrologische Menschenkunde* [Astrological Anthropology] where the fetus during pregnancy becomes attuned to celestial rhythms ending when the mother unconsciously chooses the right delivery time. Individual human behavior is then determined by genotype (genetic makeup), cosmotype (cosmic makeup), and phenotype (environmental makeup), which effectively distinguishes between planets (energy type), signs (how applied), and houses (where applied), but denies that concrete predictions can be made.

Mayer suggests that Ring's sciencey-sounding model made it attractive to many scientists and psychologists (p.782). but omits to point out that it assumes without proof what it tries to explain (astrology is true but cannot be tested), which today would be seen as pseudoscience.

Mayer later cites Peter Niehenke's pioneering efforts to consolidate German astrological views (see 7.3.2007.2), which arose because the second half of the 20th century saw:

the near complete failure of attempts to provide scientific evidence of astrology (p.787).

There was also a worldwide decrease of interest in scientific astrological research. In Germany a similar decline in general interest was evident during the period from 1990 to 2016:

- Membership of DAV (Union of German Astrologers) decreased from about 1100 to about 600 (it was 100 in 1950).
- *Astrodienst* [Astro Service] experienced a drop in interest from Germany and Switzerland of 25%-35%.
- Subscriptions to the largest German astrology magazine *Meridian* declined from a high of 3000 to about 2300.
- German bookstores with a specialised astrology section in 1970-1990 no longer had one in 2016, and direct sales had completely disappeared (all from p.788).

And interviews with 11 prominent German astrologers indicated that astrology had become:

- Diversified into everything from an esoteric way of wisdom to a useful fiction.
- An important topic for historical studies.
- More accepted in counselling, except clients wanted less self-awareness and more concrete answers (main interests were re love, profession, family) and fewer attended consulting rooms in favour of telephone calls.
- More in demand for training courses, although few can make a living from astrology (all from pp.789-790).

In **Part 2** (review of empirical studies) Mayer looks at empirical tests of chart factors and astrologers, and finds flaws that (he says) explain why the results failed to support astrology:

Chart factors. Tests to date have failed due to: **(1)** Ignoring the "limits of validity" which:

consists of an insufficiently understood and correlatively assumed connection between astronomical conditions and structures and dynamics on the earthly plane (p.816). [ie who knows what *as above so below* really means? But the connection is just a hypothesis that may be true or false, so there is no reason to automatically dismiss the results]

And because they involved: **(2)** Poor controls: shuffling does not accommodate slow-moving planets. **(3)** Zodiac signs: a human division not a natural one. **(4)** Unspecific meanings: is the accident minor or major? **(5)** Questionnaires: do they measure self-perceived personality or the actual personality? [Properly constructed tests undergo extensive validation to ensure they measure actual personality] **(6)** Prior knowledge of astrology, ie self-attribution. Therefore "the probability of proving a potentially significant correlation is extremely reduced" (p.827).

Performance of astrologers. Tests to date have failed due to: **(7)** Knowledge of subjects was limited to what was provided. **(8)** Insensitivity to the limits of validity. **(9)** Insensitivity to the language needed for writing up chart interpretations for clients. **(10)** Artificial situations not

corresponding to everyday practice which would make failure understandable, simply because there is no opportunity for "the creative or visionary genius of the astrologer" (p.819).

Mayer suggests that this last objection could be met by making the task similar to everyday practice, for example by allowing the test charts to be replaced on demand by new ones until they are sufficiently different. But when Edgar Wunder of the German Society for Anomalistics made this experiment (p.829), the astrologers could not perform beyond chance expectation (the details have not been published). Mayer then points out that in the tests to date:

Astrology as a key system of symbols and interpretations ... is pushed into the background [which] forces an examination of whether the technique used plays a decisive role (p.829). [in other words are the tests really valid?]

Comment Reasons (1-10) are unconvincing because similar problems exist throughout psychology but have not impeded progress. Mayer implies that the workings of astrology are very difficult to test, but does not explain how they could be discovered in the first place. Worse, he cites no tests in detail and no meta-analyses, so his arguments tend to be one-sided and inseparable from cherry-picking. Here are some examples:

He cites McRitchie as proving Dean and Kelly's "Is Astrology Relevant to Consciousness and Psi?" is mostly "unfounded accusations, over-generalizations, and exaggerated assertions" (p.839) without citing their response, see 7.7.2016.1.

He dismisses Dean's findings on planetary effects as "implausible for various reasons, which are not to be discussed here" (p.824), citing Ertel and Muller & Menzer but not *Tests of Astrology* despite referring to it elsewhere. He claims (p.837) that it does not cite the findings of Timm and Koberl, but all are included in a funnel plot (ToA pp.369, 420).

He cites Cornelius as not denying the "widespread failure of astrologers in scientific experiments, including his own" (p.818). But in his 2003 book *Moment of Astrology* Cornelius specifically denies making any experiments of his own because of his "sure instinct that not only would I very probably fail but that intrinsically the experiments as a whole *must* fail ... I had arrived, without philosophical clarity but with intuitive certainty, at the recognition that the premiss on which tests such as those of Vernon Clark have been consistently interpreted, either in success or in failure, is conceptually inadequate to describe and reveal the phenomena with which we are concerned" (pp.64-65). In short he just *knows* the tests are meaningless, so no need to worry about failures. Later, on his p.67, Cornelius makes everything conceptually adequate by postulating "some unknown other element" (which he equates to ESP and intuition) as explaining why astrology works – an explanation readily accepted and discussed at length by Mayer (pp.817-819).

However, Mayer totally ignores the simple faces-in-clouds explanation of astrology developed in *Astrology under Scrutiny* 2013, *Tests of Astrology* 2016, and now the present book, which fits the facts and leaves his arguments with essentially nowhere to go. To say nothing of the sheer diversity of negative findings that oppose his evident belief in astrology.

In effect Mayer is arguing that negative findings may not be the last word, which is hard to take seriously when his "few but nevertheless impressive positive individual findings" (p.830) are not identified. The same applies to his claim that astrology can be assigned to:

a justified place in anomalistics alongside cultural, historical, social sciences, and religious studies (p.830).

when its supposed inexplicability is arguably not true, see 11.13.

7.7.2020.8 Non-replication of planetary heredity N=1124

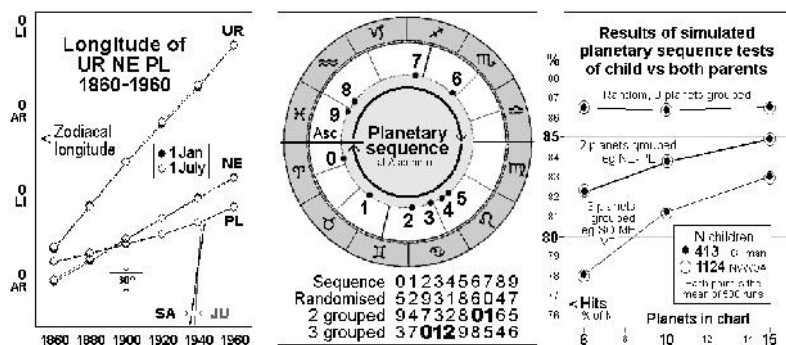
Jan Kampherbeek, "Flaws in 'Planetary sequence and astrological heredity' by Kennet Gillman", *Correlation* 33(1), 53-60, 2020, plus personal communication. An attempted replication by three NVWOA researchers of Gillman's original study in *Correlation* 29(2), 15-25, 2014. It was helped by cordial exchanges with Gillman, who sadly passed away in December 2019. Here the planetary sequence in a birth chart is the rising sequence, counted by moving the planets in longitude past the Ascendant with a correction for latitude if needed to obtain the correct rising sequence (daily motion during this movement is ignored). A hit is counted whenever a planet in the child's chart occupies the same sequential position as in the Mother's or Father's chart. Control hits are counted using shuffled parents' charts. Gillman had claimed that his results supported a new approach to heredity, and that "children tend to be born when the same celestial body (SO-PL) occupies the same position in the rising sequence that it held at the birth of one or both of their parents" (2014:24). But when NVWOA checked Gillman's original charts some errors were found, usually in a planetary position (so they seemed like data entry errors), which meant that an exact replication was not possible. So NVWOA ran the same test on a larger dataset from the same Gauquelin heredity experiments (see 6.6.6).

In each case every child was tested against both parents. Here are the results:

Test	No of children	--- No of hits ---		p
		Observed	Control	
Gillman original	413	399 (97%)	339 (82%)	<0.0001
NVWOA with latitude correction	1124	956 (85%)	976 (87%)	0.23 *
without latitude correction	1124	927 (82%)	952 (85%)	0.15 *

*Result is in the wrong direction. Gillman's p value is correct but his formula for p (2014:23) involves the variable n , which is not defined, and division by $(n_1 - n_2)$, which is unworkable because $n_1 = n_2 = 413$.

Unfortunately Gillman switched between correcting and not correcting for latitude only after looking at the chart, with no objective criterion for when to switch. Apart from allowing the possibility of subjective bias favouring positive results, it left NVWOA with no clear procedure to follow, so they were unable to say they had exactly replicated his approach. Gillman then claimed his original result still held ("not reproducing the original findings cannot be a valid reason for rejecting the original results" p.58). Regrettably neither study explored planetary sequencing for potential artifacts of astronomy, which we look at in the figure below:



Left: Outer planets UR NE PL move much more slowly than even the next outer (SA), so their distance apart might not vary much between charts and could thus be an artifact when comparing sequences. Also if say SA and UR are close in a parent's chart they cannot be close a generation later in the child's chart. Also relevant is SO-ME-VE because ME and VE are tied to SO (maximum separations are 28° and 47°).

Middle: Label the planets 0-9 (line 1), randomise their sequence (line 2), and keep two or three always together in that sequence to mimic potential NE-PL or SO-ME-VE effects (lines 3 and 4). Of course real charts are not that simple, but this way is easier than using real charts. Pretend that line 2 is the child's sequence and lines 3 and 4 are the father and mother sequences. There are two matches with father (3-3 and 8-8) and one match with mother (2-2), total three, so this case is a hit. There are typically 2-3 matches per case, range 0-12, sd typically 1.5-2.5.

Right: Run the simulation for $N=413$ or $N=1124$ children, repeat 500 times to even out the usual random variations, and plot hits as % of N against number of planets = 6, 10 and 15, just to see what happens. In effect we are testing Gillman's planetary-sequence approach on purely random data (so no heredity links can exist) with some imposed limits (however imperfect) to simulate the effects of astronomy. The results can be summarised as follows:

Above, the % hits for random positions is seemingly unaffected by the number of planets but is reduced by limits that simulate the effects of astronomy, where the fewer the number of planets the larger the reduction (roughly linearly if plotted against $\sqrt{\text{planets}}$). The % hits are everywhere surprisingly independent of the number of children.

Of course real charts will not behave exactly like this. But the results show how simulated astronomical effects can mimic supposed heredity effects in planetary sequences, so we cannot reasonably interpret Gillman's results (even assuming they are unbiased) as indicating something meaningful for astrological heredity. In that respect the results of our simulations support NVWOA's negative conclusion based on their failure to obtain positive results. In any case the similarity between observed and control hits in both studies means that hits or misses within a family group will have no clear interpretation.

Comment Gauquelin heredity data, although convenient, is compromised by its small but non-zero levels of artifactual planetary heredity due to misreporting, see 6.6.6 and 6.11.4 ff.

7.7.2020.9 Why should anyone use divination?

Pascal Boyer. Why Divination? Evolved psychology and strategic interaction in the production of truth. *Current Anthropology* 61(1), 100-123, 2020, with 7 critical commentaries, response, and 86 references. Divination is found in every human culture throughout history, albeit to different extents. French-born Boyer is professor of anthropology and psychology at Washington University in St Louis, Missouri. His work has advanced our understanding of divination like no other, which merits this paper's inclusion here even though it is not primarily addressed to astrology.

Boyer starts by noting that there is almost no research to explain why divination is important in some societies and not in others, or why it is used at all (why should entrails be assumed to reveal truth?). His answer is that divination is seen to be free of human influence and bias:

people spontaneously interpret divination as less likely than other statements to be influenced by anyone's intentions or interests [so] it provides a focal point for efficient coordination at a minimal cost for almost all participants (p.100).

But why should anyone see the result as accurate and truthful?

Quite surprisingly, a large part of anthropological reflections on divination have consisted in attempts either to avoid this question or to deny its relevance ... [divination being seen as] everything one could think of, except as an attempt to acquire accurate information about some matter of interest (p.100).

A good example of denying its relevance is the anthology edited by Patrick Curry, *Divination: Perspectives for a New Millenium* 2010, which Boyer cites (p.100) but does not discuss. The anthology shows zero concern for accuracy, only for "metaphorical truth" (ie useful like Santa Claus but not necessarily true) where astrology is "the most durable, widespread and complex form of Western divination" (p.5). Just following traditional rules is not enough, so diviners have to use their own judgement, which is the main reason why:

empirically "testing" divinatory claims (including astrological ones) is such a hopeless non-starter, and one that begs to be redefined by the testers in such a way as to exclude the diviner: a move which in turn guarantees a negative result. It never fails to amaze me [Curry] that so many astrologers are repeatedly so naive, or deluded, as actually to encourage such "testing" (p.117). [For example *Correlation* 1(1), 4-10, 1981 told us "astrology is in urgent need of good research" (p.4) and that competition between ideas "is healthy" (p.8). Ironically its author was Patrick Curry.]

The anthology understandably makes no attempt to measure anything, which reduces the above argument to assuming what one wants to prove. It is here that Boyer is the exact opposite. He injects empirical observations from anthropology and psychology (plus clarity) into areas the anthology seems unable to address without drowning in rhetoric and obfuscation.

But back to the question of why anyone should see divination as accurate and truthful. Boyer's answer is that the result is determined by the process and not by the diviner, so the outcome is seen as more likely to be accurate than other sources of information. Simply because:

Human minds automatically process the possibility that people's interests are involved ... when the consequences of believing [are important]. Even young children have the intuition that [interests govern content] (p.101).

More specifically, the process does not provide reasons for holding the divination true but removes reasons for doubting its truth:

What matters is that the diagnosis is not produced by the diviner himself or herself, which makes it more reliable than ordinary statements, by virtue of it being less unreliable (p.104).

The absence of a reason to disbelieve (rather than a reason to believe) contradicts the widespread view that clients believe because divination provides a direct link to gods, spirits, and other superhuman agents. Also the view does not explain why people in modern societies:

trust clairvoyants, have their future read in the palm of their hands, or consult tarot cards, without ever representing that any superhuman agents are involved in these processes. Indeed, a large number of people in such societies do not even think of superhuman agents as being involved in their lives at all, yet they trust divination procedures (p.104)

How does this trust arise? Boyer (p.105) suggests two ways:

- No reason. They just accept, no questions asked.
- Various reasons (gods, hidden realities, paranormal links). Again, no questions asked.

In other words, people trust divination but do not reflect on why they trust it. An important point is that trust applies only where the required information is either scarce or unreliable:

Consider, for instance, the lover who plucks petals to find out whether her feelings are reciprocated. ... As soon as the lover can have a better source, for example, by reading the beloved's private diary, she will probably ditch the petals as a way of guessing the other party's feelings (p.106).

In other words the truth value of divination is relative and useful only to the extent that other sources are worse. Here five conditions (p.107) help to make divination hard to refuse:

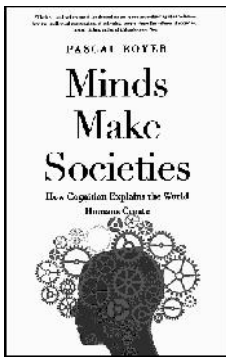
- There is no other option. • The facts matter (where to go hunting). • The facts are costly (someone has to die).
- Severe problems if wrong (someone must pay a penalty). • There is a general benefit (so everyone is happy).

It is hard to refuse because the divination comes from no one in particular and is thus free of perceived bias. That said, we should not mistake claims like "divination is never wrong" as a personal belief, any more than we accept "a Scotsman never lies" as a personal belief rather than a desirable norm. Indeed, even when divination is officially sanctioned, people may not believe it, simply because a diviner can be incompetent or a fraud or use defective procedures or secretly use tricks to bias outcomes in preferred directions (see 8.9.4.11 and 8.9.5).

Nevertheless Boyer argues that divination's apparent freedom from vested interests raises it above automatic suspicion. What did the commentators think of this? They were in general agreement ("absolutely correct" p.111), with only minor amendments. For example:

(1) People often need reasons to accept rather than having no reasons to reject. (2) Freedom from vested interests is rarely obvious – the diviner is still in control of the outcome. Both problems are met if the divination agrees with the beliefs of the stakeholders, as might be guaranteed by a shrewd diviner in touch with the underlying politics. "After all, it would be odd if divinatory statements could influence an important decision in a direction no one likes" (p.113).

Nevertheless we might still see detachment as a slender basis for the popularity of divination, especially since the advent of social media around 2000. So let us take a closer look:



In his 2018 book *Minds Make Societies: How cognition explains the world humans create*, Boyer draws on multidisciplinary research into human memory, motivation, and communication to show how evolution gave us ways of reasoning that dominate our cultures and beliefs. In response to the question *Why are people persuaded by so much wrong information?* (eg rumours, superstition, urban conspiracies), he points out that:

the effect occurs only in highly constrained conditions, for instance, when the participants have no other evidence than what is presented to them, when they have reason to trust the [source], and, most important, when the information in question is of no concern to them. When the information matters, or when people have several sources to choose from, people are much more difficult to persuade (p.73).

Which leads to a sort of arms race between our evolved abilities for deception and detection:

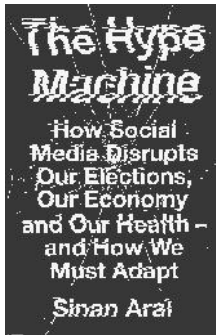
between the capacity to make one's utterances persuasive, on the one hand, and the ability to protect one's beliefs from deception, on the other. ... Most important, experiments show that people are quite good at judging (and accepting) valid arguments ... especially in matters that they care about (pp.74-75).

For example we are especially attentive to information about potential threats. Thus we worry about spiders among flowers but not about flowers among spiders. If the threat is plausible and easily noticed, but uncertain and not costly to ignore, there is little incentive to test it and much incentive to just accept it. Thus we might not bother to test the idea that the outcome of walking the wrong way around a cow is that we may sneeze. Yet very often:

the transmission of low-value [eg false] information is associated with strong emotions. People consider information about viruses and vaccinations and government conspiracies as terribly important. When they transmit information about such topics, people are not just eager to convey but also eager to convince. They do pay attention to their audience's reactions, and they consider skepticism highly offensive. Doubt is attributed to all sorts of wicked motives (p.82).

Thanks to strong emotions, false information survives. Which brings us to **social media**, which allows anonymity, eliminates geography, fosters internet rumours and crusades, and fools us into illusions of consensus – the illusion that sources are independent, that great minds think alike – when all that has happened is the reading of the same web page (p.91).

Anyone who has Googled *social media* will know of its rapid rise, vast resources (in 2020 Facebook alone had over 50,000 full-time employees, was available in over 100 languages, was used by 75% of the US population and 30% of the world population, earned a staggering \$86,000 million, and its machine intelligence made 200 million million predictions *every day*), and of course its scandals about misinformation, fake news, privacy, and trust.



The extent to which social media can bias opinions and create falsehoods is empirically tested in the 2020 book *The Hype Machine* by professor of data science at MIT Sinan Aral, all based on twenty years of scientific research working closely with companies such as Facebook, Twitter, and LinkedIn. The results reveal the quite extraordinary capacity of their:

deep learning neural networks to analyze the text we type, the audio we speak, and the facial expressions and body positions in our pictures and videos to understand what we are doing, what we are interested in, what makes us happy or sad, and how the things that motivate us are related to our engagement [ie interest in what we see onscreen], purchasing patterns, and connectivity [links with others] (p.77). [Which among other things would seem to make learning astrology – even sun signs – hardly worth the bother]

Social networks structure the flow of information and its influence on society in two ways :

First, they guide the structure of the human social network itself by providing access to digital connections and influencing the structure of those connections through friend-suggestion algorithms. Second, they use data about our connections to build more accurate models of our preferences. [In this way] digital social networks help determine what we buy, what we read, who we vote for, and even who we love (p.63).

Two other properties of social networks directly influence what people are experiencing:

First, it's *clustered* more than one would expect by chance, meaning we form dense clusters of people who are highly connected within the clusters, much more than we are connected across the clusters. Second, it's *homophilous*, meaning similar people connect. These two properties explain why [it] helps foster political polarization and echo chambers, spreads fake news, and generates outsized returns on marketing investments (p.64).

In other words it connects you with people who share your views, which (1) favours one-sidedness and (2) limits learning from opposing views, thus denying the breadth necessary for wisdom. It also favours fake news and false beliefs (because they are more novel than truth and 70% more likely to be shared, which then boosts ad responses and media income). Which is:

about to get a whole lot worse. We are on the verge of a new era [of machine-generated falsity] ... that some fear will usher us into an "end of reality" ... [worse than anything] we have seen so far (pp.52-53).

How good are you at telling truth from falsity? A bat and ball together cost \$1.10. The bat costs \$1.00 more than the ball. How much does the ball cost? If your answer was 10c your thinking is more intuitive (and in this case wrong) than analytical, and less able to tell truth from falsity. Regardless of your answer, the future for critical thinking does not seem good.

Comment *Perceived-freedom-from-human-bias-divination* is not the same as the *source-of-new-viewpoints-divination* in 8.9.4.15, so we asked Boyer for his views. The latter kind was absent from the anthropological record, so it was misleading to see it as genuine divination.

7.7.2020.10 Are archetypes a myth? Case for and against

According to Jung (1876-1961), the *collective unconscious* is a sort of universal essence given to all humans at birth. It consists of unlimited numbers of symbols or mental predispositions that he called *archetypes* – examples are Mothers, Heroes, Trees, Death, and (closer to astrology) Energy and Change. These predispositions or archetypes are not of the material world, cannot be isolated for testing, are the same for everyone, and can be known only directly and only by the mind. Jung believed that, when the circumstances were right – which was usually in times of crisis – the right archetypes arrived unbidden in the mind. So when a crisis seems to lead to transcendent truths (as in *my life flashed before my eyes*) it is actually tapping the collective unconscious, which then releases one or more archetypes to reveal deep transcendent truths hidden from ordinary consciousness. The archetypes can arrive in many forms – in dreams, images, fevers, derangements, and chance encounters with what Jung called *meaningful coincidences*. The collective unconscious is mostly free of time and space constraints, so by a process Jung called *synchronicity* it can lead to paranormal experiences and coincidences whose compelling meaning distinguishes them from ordinary coincidences.

Jung lived a century ago, in a personal world blessed (some might say afflicted) with spirit guides and fantasy-proneness, see 8.9.6.1, well before the workings of the human mind had been experimentally explored. For example Jung was 60 when factor analysis became accepted as a research tool allowing the source of his ideas to be better understood. Indeed, critics see no reason to accept his ideas, simply because what they explain is more simply explained by apophenia, the ability of the human mind to find meaning where none actually exists, see 9.4. Not for nothing did the eminent US historian of psychology EG Boring, in the 1957 second edition of his classic *A History of Experimental Psychology*, with its meticulous attention to nearly 2000 researchers over 150 years of activity, conclude his 60 words on Jung (Freud gets 10 pages) with "It is impossible to pursue the complexities of Jung's system further" (p.713).

Case for myth

Jon Mills. The myth of the collective unconscious. *Journal of the History of the Behavioral Science* 55(1), 40-53, 2019. The author is professor of psychology and psychoanalysis at the Adler Graduate Professional School, Toronto, Canada. Jung held that his metaphysical ideas were scientifically grounded. But because they cannot usefully be tested, they are not scientific at all – only pseudoscientific. Here Dr Mills rises to the challenge of assessing an untestable idea.

Mills points out that all theories of the mind involve processes common to everyone. But Jung's bold claim is unique in postulating the existence of:

a transpersonal psyche that remains the ... wellspring from which all unconscious and conscious manifestations derive. ... in fact this concept may very well be the most controversial aspect of Jung's analytical psychology (pp.40-41).

If archetypes are part of a collective psyche given to everyone at birth without material help, it means they arrive via a supernatural process, which if followed through would be

disastrous for Jungian studies, as the theoretical foundation of analytical psychology [ie Jung's brand of psychology] would succumb to inventing unverifiable fictions that satisfy the wishful fantasies of imagination at the expense of reason, logic, and science. Why presume a supernatural process when ordinary cognitive processes do the job just as well? Why is it necessary to postulate such a process in the first place? (pp.41-43).

Perhaps because ordinary psychological processes (as known in Jung's day) failed to address:

the *mysterium* of the transcendent, the religious, the soliloquy of affective [ie emotional] life ... intuitive internal reverberations or self-states, aesthetic and moral intuitions, and the pursuit of the numinous and sublimity (p.47).

Mills stresses that it is not necessary to have a supernatural agency pulling the strings behind our psychological curtains. As a result, albeit without the benefit of modern research:

Jung embarks on a theoretical leap of faith and introduces all kinds of philosophic problematics, such as the question of origins, the question of agency, of ground, of how the personal consciousness is colored or conditioned by another entity, of freedom and determinism, and so forth. ... By today's standards, at face value, Jung's theory is antiquated and unsubstantiated from the domain of logic and modern scientific principles ... [it] is illogical, if not delusional. ... How could [it] possibly work, let alone be remotely probable? (pp.48-51).

So archetypes / the collective unconscious are fantasies ordained with numinous value (p.40).

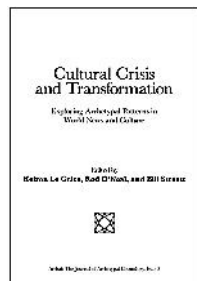
Case against myth

Andrew Neher. Jung's theory of archetypes: a critique. *Journal of Humanistic Psychology* 36(2), 61-91, 1996).

Like Mills, Neher concludes that Jung's ideas are "based on a shaky foundation" and involve "serious doubts" (p.82). Nevertheless they provide a comforting perspective. Like Rorschach inkblots they allow useful projections plus a quasi-spiritual approach that appeals to people longing for that dimension in life (pp.82-83). He makes the same point in 7.2.1990.10.

In 2008 an apparent leap in the case against myth occurred with the publication of *Archai: The Journal of Archetypal Cosmology*. It arose from the first meeting of the (mostly Californian) Archetypal Research Collective, which had the express aim of "founding and developing a new

academic discipline known as archetypal cosmology". The journal is issued every one or two years, each with its own theme and its own editor. Its current circulation is 500.



Archai is "an academic journal that explores significant correlations between cyclical alignments of the planets and the archetypal patterns of human experience" and is "dedicated to furthering the research orientation and methodology established by Richard Tarnas in *Cosmos and Psyche: Intimations of a New World View*", published in 2006. Picture shows the cover of issues 2 (2009) and 5 (2016). Current next issue is 8 (2022),

Articles follow Tarnas's approach, see 7.2.2006.2, namely:

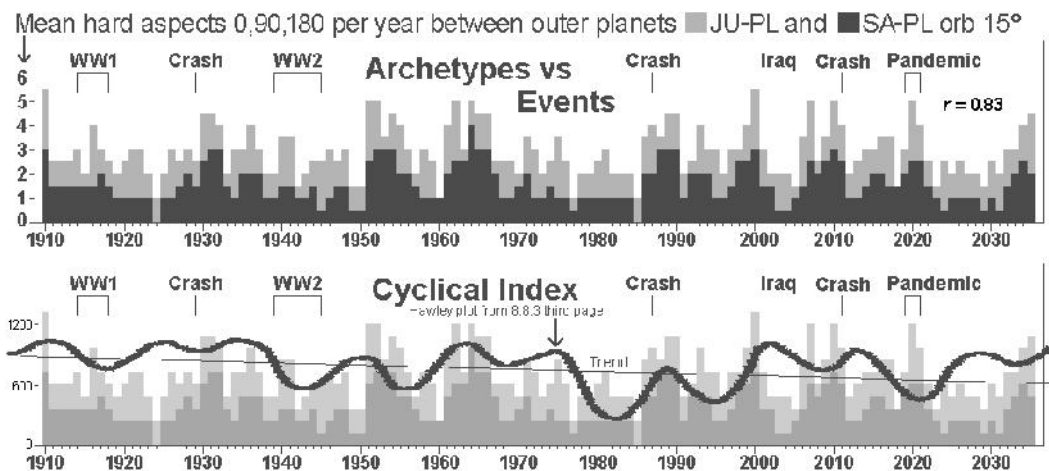
(1) Ignore tests, controls, and empirical views. (2) Embrace confirmation bias, cherry-picking and other hidden persuaders. (3) Appeal to assumed sublime conditions expressed in abstract terms such as *enchantment*. In this way readers are mercifully kept from awkward ideas like *probability* and *effect size*. An example is "Everlasting Concrecence [ie growing together]: A Process-Related Cosmology" (*Archai* 6, six pp, 2017) by Becca Tarnas, a counselling astrologer and daughter of Richard, who asks *why does astrology work?* and in due course replies:

The birth chart [expands] the archetypal particulars of this person. ... By consciously engaging with the archetypes as we co-creatively manifest them, we are reshaping the potentialities with which they will manifest in the future.

Thus if we see an illusion (eg faces in clouds) as real, they can have real effects. Another example is "Holotropic [moving towards wholeness] Research and Archetypal Astrology" by Stanislaw Grof (*Archai* 1, 50-66, 2009) in which he claims that holotropic research:

has amassed a significant body of evidence that quite specifically supports the fundamental assumptions of astrology. ... If the cosmos is a creation of superior intelligence and not a supermachine that created itself, it then becomes more readily plausible that astrology could be one of many different orders built into the universal fabric. It could be seen as a useful and even necessary complement to the field of science (pp.63-64).

But Grof's claims are never accompanied by the results of controlled tests, so critical readers have no reason to believe what he says. But if in doubt they can turn to "World Transits 2000–2020: An Overview" by Richard Tarnas (*Archai* 2, 147-212, 2009), which extends the coverage of *Cosmos and Psyche* (written 2005) for a further five years, but necessarily does not correct the fatal problem of his approach, which is illustrated below by our plot of the number of outer-planet hard aspects for each year 1910-2035 with 15° orbs, ie without his extra "penumbral" 5°:



Top: Yearly aspect numbers are the mean of those in mid-March and mid-September. Means are 2.9 sd 1.1 among JU-PL and 1.6 sd 0.8 among SA-PL for $N = 126$ years. So finding a pre-determined match with any world event is hardly a problem. But the expected high numbers for major world events and stock market crashes are inconsistent (low for WW1, WW2, Iraq), which suggests that the claimed matches are merely an artifact of vague archetypal meanings and lack of controls in keeping with Neher's comments. As an example the 2020 pandemic (not mentioned by Tarnas) had SA-90-UR *sustained crisis of change and destabilisation*, SA-0-PL *sustained crisis of power and violence*, and UR-90-PL *overwhelming collective drive to make the world radically new*, which is both a hit and a miss – a verdict that could arguably be applied to any event. So his fail-safe way to find hits is to ignore misses.

Bottom: The cyclical index (see 7.4.1993.3 and 8.8.3) involves the same outer planets but in a different way. The match is good at 1963, 1989; bad at 1925, 2004; with mean $r = 0.11$, $p = 0.39$. So there is no consistent match.

Conclusion: the case against archetypes being a myth is essentially that of seeing faces in clouds, a very real ability to find meaning where none need exist (which also describes the case for astrology, see later in 11.8). Indeed, archetypes might more realistically be called stereotypes, which coincidentally leads to the next summary in this very long chapter:

7.7.2020.11 Chinese test of Western sign stereotypes $N=173709$

JG Lu, XL Liu, H Liao, L Wang. Disentangling Stereotypes from Social Reality: Astrological Stereotypes and Discrimination in China. *Journal of Personality and Social Psychology* 119(6), 1359-1378, 2020, with 100 references. A stereotype is a fixed generalisation that people have about things ("gypsies are psychic"). Are Western sign meanings based on actual observation or on stereotypes? The recent introduction of Western signs in China led to this ingenious study, which is also relevant to the idea of astrology as a language. But first a note on English-Chinese translation:

English works (more or less) via individual letters, so c-a-t means *cat*. In Chinese there are no letters, only thousands of ideographs, each requiring up to 33 strokes to write, which indicate its meaning but not its pronunciation. Chinese is a tonal language where tone indicates what the same word means (think of *it's hot!* vs *it's hot?*). So most Chinese words have two elements, one indicating the class (out of 214) to which the word belongs such as *wood* or *water*, the

other an unrelated word whose tone is the one required. Thus *ocean* = *water* plus *sheep* because *sheep* has the same tone as *ocean*. Translation is not a simple matter (from Katzner. *Languages of the World* 3rd edition 1995:204-207).

Western sun signs have recently become mainstream in China. Thus in 2013 the fifth most popular mobile search term on the most-used Chinese search engine was *astrological sign*. But signs are too recent to have established meanings, for example the idea of *Virgo* does not exist. So China is an ideal ground for testing ideas about sign stereotypes and how they arise.

The authors used the Chinese data collection website www.wjx.cn (which averages over one million visits per day) to recruit 518 subjects mean age 30 (62% female) and paid each one 3 Chinese yuan (about 45c US) to complete a short survey:

73% were familiar with sun signs. 65% agreed they affect personality. 65% agreed they help to understand a person.

Each subject was also asked to select the most negatively perceived sign in China. and indicate whether they would disfavour that sign (whatever it was) in:

Social interactions (46% said yes). Romantic dating (32% said yes). Job recruitment (36% said yes).

The study was repeated on a fresh sample of N=518 in China and N=495 in the USA where each subject had to select the most negatively perceived sign. The Chinese subjects also chose three or more signs they were familiar with and described their personalities in adjectives. The results (excluding those unsure about the most negative sign) were:

Sign	From 8.3.2	%	Common Chinese meanings*	% Negativity China	USA	
白羊	AR	assertive	46	Tender, straightforward	5.5	6.8
金牛	TA	possessive	80	Materialist, conscientious, stubborn	4.6	8.2
双子	GE	versatile	59	Temperamental, dual-personality	5.5	11.1
巨蟹	CN	sensitive	33	Home-loving	2.7	18.7
狮子	LE	creative	67	Bold, proud, leader	3.5	4.4
处女	VI	critical	81	Critical,germophobic [= fears germs]	44.6	6.3
天秤	LI	harmonious	41	Fair, indecisive	2.4	5.3
天蝎	SC	secretive	42	Venomous, vindictive	15.3	17.7
射手	SG	adventurous	35	Carefree	3.5	2.9
摩羯	CP	prudent	24	Arcane [= mysterious]	5.5	6.3
水瓶	AQ	detached	51	Imaginative, idiosyncratic	2.7	7.3
双鱼	PI	impressionable	30	Moody	4.4	4.9
			$r = 0.278$ (N=8 excludes scores >10)	$r = 0.027$ (N=12)		

$r = 0.278$ (N=8 excludes scores >10) $r = 0.027$ (N=12)

*Each meaning (and their synonyms) comprised at least 15% of the adjectives given by participants for each sign. They are listed in decreasing order. The preceding % column shows the total for each sign, mean 49% sd 19%.

The difference between Chinese and US negativity ratings generally parallel the difference in meanings, which reveals the problems of translation. For example in English it is not obvious that *Taurus* means *bull*, nor is it used except in an astrological context. But in Chinese its two-item translation 金牛 means *gold bull*, and both items are in common use in everyday life. So not only is the materialism of the Chinese *gold* stereotype added to the stubbornness of the Western *bull* stereotype, its effect is also likely to be stronger in China than in the USA because the words are in more common use. Similarly *Gemini* is seen as *dual personality* because the Chinese translation is *two persons*. But *Virgo* is clearly unusual:

Possibly because in China the word "old virgin" is used to describe spinsters who are critical, fussy, and picky about men. ... In particular, a large percentage of participants ... self-reported that they would most likely discriminate against Virgos in romantic dating, social interactions, and job recruitment (p.1366).

As a check, the authors obtained 388 subjects unfamiliar with signs and gave them one of two translations of *Virgo*, namely the well-known *virgin* of astrology and the lesser-known *royal chamber lady* of astronomy, which they had to rate against the four adjectives *critical*, *quarrelsome*, *sympathetic*, *warm* presented in random order. The astrology meaning was significantly seen as more negative than the astronomy meaning (by t-test $p = 0.00002$, $r = 0.22$).

As a further check, the task of judging a job application that (unknown to the subjects) mentioned either *Virgo*, *Leo* or *Libra* (it is common to have sun sign mentioned in Chinese job

applications) was given to 823 employed subjects, and 322 professional job recruiters mean age 30 (72% female) from 24 different industries. In each case the subjects were more willing to hire a non-Virgo than a Virgo (by t-test $p \leq 0.010$, mean $r = 0.13$) and saw Virgo as less agreeable than non-Virgo (by t-test $p < 0.001$, mean, $r = 0.17$). Gender had no effect. Of the professionals about 40% said they often discussed an applicant's sign with their colleagues.



You are a young Chinese lady living in one of China's three largest cities (populations 24m, 21m, 11m). On one of China's most popular dating websites (23m users) you discover this picture of Michael, age 28, living in the same city, whose sun sign is said to be X (unknown to you X is randomly shown as Leo, Virgo or Libra). If you fancy Michael you can register a like. He seems cheerful and friendly. So what do you do? The experiment lasted nine days during which time 102 likes were registered with a consistent breakdown of Virgo 15%, Leo 40%, Libra 45%, regardless of city. So the cheerful photograph was outvoted by China's sun sign stereotypes.

Finally the authors collected 173,709 responses to a 40-item Big Five inventory via a Chinese psychometric website. Mean age was 23.5 (49% female). Signs vs scores gave these results:

Big Five dimension	Extraver	Neurotic	Openness	Conscien	Agreeabl
p vs sun sign N=173709	0.002	0.98	0.35	0.06	0.84

Conclusion: Big Five scores were mostly unrelated to signs except for extraversion ($r = 0.013$, well below the 0.06 typical in the West due to self-attribution, see 8.3.7), which supports the expected lack of self-attribution in Chinese people due to recency and translation problems.

Does sign predict job performance? To find out, the authors analysed the job records from a large Chinese conglomerate for 29,057 non-managerial employees and 3821 managers, mean age 31 (30% female), who were working in five divisions (technology, product, marketing, design, speciality). Sign was unrelated to the performance score (perhaps the most important measure for deciding things like promotion and bonuses) in the most recent period ($p = 0.71$) or the mean of the last five periods ($p = 0.95$), and remained unrelated when divided by gender, age group, educational level, rank, division, sign polarity or element (no $p < 0.05$).

From their results the authors concluded that sun sign stereotypes in China are:

a result of how the astrological signs were translated into Chinese (p.1374). Because Western astrological signs were popularised in China only recently ... astrological stereotypes are unlikely to have had sufficient time to shape social reality (ie personality) to mirror the stereotype. [But they may] *become predictive* over time. As evidenced by our studies, astrological discrimination is already jeopardizing the opportunities of individuals of certain astrological signs in romantic and professional life. Just as some Chinese parents are less willing to have babies in the Chinese zodiac years of the Sheep, anecdotes suggest that some Chinese parents are now less willing to have Virgo babies. [In other words] If men define situations as real, they are real in their consequences (p.1375).

7.7.2020.12 The V-W difference in zodiacs is just for starters

Vedic (Indian) and Western astrologies (here V and W) diverged about 2000 years ago and now firmly disagree on chart factors, usage and interpretation, yet each claims to be based on observation. V is also more complex. Both have many varieties but the differences below (from *Recent Advances* 1977 and US astrologer/VW specialist Hank Friedman's www.learnastrologyfree.com/differences.htm 2012), which introduce the next summary, tend to be common to all.

Zodiac. W begins at 0° tropical AR defined by the seasons, V begins at 0° sidereal AR among the fixed stars at a point whose location is disputed. The difference at any given time is called the *ayanamsa* (pronounced ayaNAMsha) from the Sanskrit for precession, but even this is subject to disagreement. In 1950 the range of values for 15 authorities was 19° to 32°, mean of the most agreeing ten was 22.6°±1.0°; the official Indian government (Lahiri) value was 23.2°, which puts 0° sidereal AR at 6° tropical PI in 2020 and 30° in 2450, thus defining when its Age of Aquarius begins.

Signs. W uses sign meanings as in sun sign columns, V uses signs mainly to determine rulerships, planetary strength, and applies much wider meanings depending on the ruler's placement. MO sign is more important than SO sign.

Planets. V does not use UR, NE, PL because they disrupt the rulership system and their work is already performed by the Moon's N node Rahu and S node Ketu. Unlike W, SO is a malefic, understandable in a hot country like India.

Moon's nodes. Essential in V, seen as shadow planets to emphasise their karmic importance. Rahu future karma, Ketu past karma. Both amplify or distort when linked with another planet. Their value and effect in W is disputed.

Rulerships. V same rulerships as in W before UR NE PL were discovered, no detriment (opposite to own sign), if detriment is mentioned it means fall (opposite to exaltation, which is by sign and in V is held to give the best results, even better results if close to the degree of exaltation, which is rarely used in W). Rahu and Ketu have no rulerships.

Houses. W 1st starts at Ascendant then either equal 30° houses, or 10th starts at MC with generally Placidus (many others) in between. V 1st starts at either 0° or 15° of the rising sign then by whole signs. Unlike W, V meanings tend to be based on house triplicity/quadruplicity, are more numerous than W, and can differ eg V 5th = W 6th.

Aspects. W links planets by prescribed angular separations, the separation indicates meaning. V links planets only by same or opposite house, generally with no orbs. So any planet in AR opposes any planet in LI. MA at 1° AR does not oppose JU at 29° VI. The aspecting planet indicates meaning MO-ME-VE-JU benefic, SO-MA-SA-Rahu-Ketu malefic. MA can also link forward 90° in zodiac backward 150°, JU either way 120°, SA forward 60° backward 90°. Thus JU in 1st affects 1st and 7th, plus 5th and 9th by its special 120°. V planets within 6° or 3° of SO are weak or very weak.

Orbs. W narrow orbs are stronger. V no orbs, strength depends on planet making aspect. Even weak malefics work.

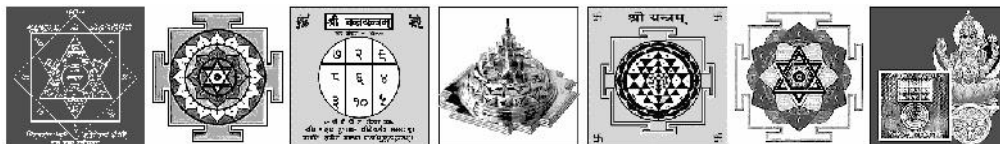
Planet strength. In both W and V strong in own sign or exalted, weak in fall. In W retrograde is weak, strong in V. Also strong in V are ME JU in 1st, SA in 7th, MO VE in 4th, SO MA in 10th. MO in V is weak within 72° of SO and strong within 1 sign of the Full Moon sign. Planets 1° apart are strong in W, weak in V like SO-MO during an eclipse.

Harmonic Charts. Unlike W, V routinely uses harmonic charts for different areas such as career, parents, spouse. The 9th (*navamsa*) chart indicates marriage and many key things including the strength of planets and the second half of life, Harmonic charts are sensitive to time and are routinely used for chart rectification.

Lunar Mansions. W rarely used. V lunar mansions (*nakshatras*) are central to V electional astrology (choosing when to get married, go to war, build a house) and are also used in natal astrology and in predictive techniques. Chinese/Arabic astrologers use 28 lunar mansions, V use 27, both roughly the lunar sidereal month (27.322 days).

Main Predictive Method. W progressions and transits, sometimes supplemented with directions and solar returns. V has no equivalent. Instead birth occurs during the period allocated to the ruler of the natal Moon's lunar mansion. The rest unfolds in sequence one planet at a time for their allocated periods: Ketu 7 years, VE 20, SO 6, MO 10, MA 7, Rahu 18, JU 16, SA 19, ME 17. Each period is divided into subperiods ruled by each planet in turn. If the period and sub-period rulers are related in the birth chart then its meaning will be especially marked during that time.

Approach. V covers each area of life with four factors: house, house ruler, the area's significator, and the relevant harmonic chart. Readings embrace everything from the most depraved to the most enlightened (including karma) to help clients understand their lot in life. W does the same with quite different factors (natal planets, signs, houses or midpoints, and aspects), but most astrologers see negative readings as damaging and unethical, so they avoid them.



V has one feature imported from religious rituals that is not strictly astrological but is now common practice, namely ways of modifying chart indications by amulets, gemstones, and *yantras*, mystical diagrams on paper, wood or metal representing planetary deities and said to neutralise afflictions from a particular planet. Pictured are Moon yantras to help neutralise an afflicted Moon and bring health, wealth and happiness. Similarly Saturn yantras help to eliminate poverty, sadness and sorrow. Lockets start at around \$20 posted, while solid castings cost up to \$500. On receiving a yantra you should take a bath early in the morning, offer red flowers, sandalwood, and rice, then worship it by repeating the supplied mantra 108 or 1008 times because without daily worship yantras won't work. Goel et al (*International Research Journal* 5(1), 2015:6) found the most popular pages of an unspecified astrology website were on *yantras* and other remedies for planetary afflictions.

Awkward Points. The existence of two zodiacs is a challenge that astrologers either ignore, explain via unsupported speculations such as inner vs outer or potential vs actualised, or argue about without resolution. Thus a vigorous exchange in the UK journal *Astrology* 37(3), 85-92, 1963 continued unabated through 39(1), 32, 1965 until terminated by the editor. But signs are Western astrology's most disconfirmed chart factor (see end of 8.3), so why should they be any different in Vedic astrology? Indeed, if the sidereal zodiac is essentially a reflection of stellar influences, why is it divided into 12 equal signs when the distributions of stars is so unequal? If the tropical zodiac begins where ecliptic and equator intersect at the spring equinox, why is it not reversed in the southern hemisphere? And so on.



Astrology and karma are scholarly doctrines seen in all parts of India as relevant to human destiny. But their mode of operation – astrology via cosmic principles, karma (there are many versions) via moral behaviour in a previous life – tend to be in conflict despite the common assertion that "planets make past karma visible". French anthropologist Caterina Guenzi (pictured) observed Vedic astrologers counselling middle- and upper-class clients in the holy city of Varanasi (population 1.5m) during 1999-2008 (*Social Analysis* 56(2), 39055, 2015) and found that only in rare dramatic cases like unexpected death did karma enter the picture.

The same disconnect existed in modern astrology books. Thirty years previously the French anthropologist François Chenet had found that almost all Indians felt "astrology is karma" (*Diogenes* 33(129), 101-126, 1985: 102). But Guenzi suggests the new disconnect is mostly due to widespread social changes since the 1990s, which led to astrologers seeing "destiny (or *bhagya*, literally 'allotted share') ... as a form of wealth acquired at birth that can be augmented or diminished as a result of planetary influences ... linked ... to values of achievement [in] middle- and upper-class families". (p.39)

Conclusion. The complexity of V is usually seen as immunising it from the results of W research. But its complexity also means that V could not have arisen from empirical observations (see Chapter 3) and is even more open to hidden persuaders. The trend implied by Guenzi away from dominant religious influences towards more materialistic ones was not matched by an interest in empirical tests, nor was there any such interest in Campion and Dreyer's survey *Indian Astrology* (in D Lim ed, *Religious Transformation in Modern Asia* 2015: 163-191 with 94 references), although they do note that Hindu astrology has been rebranded in the West as V to project a spiritual image. The study below corrects this lack of interest in tests, but not in the usual W way of seeing whether charts containing X have owners who are X-ish. Adverse (negative) indications in V are based on the negativity of relevant planets, house rulers, and houses. Similarly beneficial (positive) indication in V are based on their positivity. Here these ideas are put to the test:

7.7.2020.13 Testing Vedic astrology via exactly opposite groups

Nagesh Rajopadhye et al, Empirical testing of Vedic astrology by analysis of persons with cancer versus persons who never had it [abridged title], *International Journal of Applied Research* 7(5), 74-85, 2021, Plus *The Skeptic* [UK] June 2021, their website www.AstrologyYesOrNo.com, and personal communications 2021. First some background:



The lead author (pictured) has a PhD in solid-state physics, 22 published papers, and was for 25 years prominent in information technology. He also studied astrology but failed to find scientific evidence for its validity. Yet "90% of arranged marriages in India happen only after matching [birth charts] and 30-40% of our population make life decisions using astrology, without precisely knowing if it is really a science" (from website). In his paper he adds "this reliance is not age-dependent and is in fact growing rapidly because of its popularity among the younger generation ... through social media ... [so it is] necessary to test astrology scientifically" (p.74). Tests of Western astrology have no effect in India because Vedic astrology is different and is seen as coming from the Vedas, ancient (c1500 BC) Indian sacred texts. The test by Narlikar et al (see 7.6.2013.1) created "ripples [but] an ambiguity remains whether the results are due to limitations of astrology or astrologers".

So there was a need to test Vedic astrology rather than astrologers. And in due course he had the time and help from others experienced in astrology and computer techniques to proceed:

It was no easy job, but we did it through a 10-year-long committed research project. ... using a unique computer-based approach and thousands of birth charts [to compare] exactly opposite groups – cancer vs no cancer, divorce vs long married life, timely and long married vs never married, mentally retarded vs intelligent, celebrity vs ordinary, and so on ... by investing our own funds and with no commercial interest" (from website).

Exactly opposite groups were as objectively distinct as possible and thus left minimum room for uncertainty over their difference. Also necessary was a strong impact. For example:

the impact of cancer on a person's life is very serious and disastrous when it occurs before the age of 60. Not only does it affect the lifespan of the diseased person, but it hampers his finances, career, mental health and the entire family. Very often, responsibilities remain unfulfilled and the patient's life is completely turned upside down. ... If astrology is true, one expects that such a severe impact on a person's life will show strong astrological signatures, especially with negative influence, in their birth charts, which is expected to reflect in the test results (p.75).

But to be exactly opposite required a careful choice of criteria. Thus the cancer groups were:

Yes – persons who were diagnosed with cancer before age of 60. **No** – persons who lived longer than 80 years and never had cancer during their lifetime ... we wanted to make it sufficiently evident that they completed their lifespan without having cancer and it did not interfere with their life in any way (p.75).

Data were from Lois Rodden's AstroDataBank, birth accuracy was the best available (recorded by family or state), and all were born after 1900 with a minimum combined sample N of 600.

Fundamental factors in Vedic astrology

The fundamental factors in Vedic astrology would not be unfamiliar to Western astrologers:

Planets Sun through Saturn, the Ascendant, and the Moon's nodes Rahu and Ketu,

Houses 1 through 12 and their **House Rulers**, ie the planet ruling the sign on the house cusp.

(Aspects are not fundamental factors because they are included in the way the above factors manifest.)

Each factor can manifest both positively or negatively via positive or negative rules, but there is no single historical document that describes these rules. So they were established by going through reputable textbooks and articles and by discussions with astrologers. The end results were 9 negative rules and 6 positive rules for planets, 10 and 8 for house rulers, 4 and 4 for houses, making a total of $23 + 18 = 41$ rules on which there was general agreement:

They are regarded as the foundation of [Vedic] astrology in [Vedic] textbooks and in our opinion their importance is

such that if they are proved or disproved, it is as good as validating or invalidating astrology (p.75). We believe that there will be no disagreement with them from the astrological point of view (p.76).

In other words they are a test of Vedic astrology, not Vedic astrologers. Some examples:

	Negative rules	Positive rules
Planet is	0 90 180 $\pm 4^\circ$ to MA SA Rahu or Ketu. Debilitated in navamsa chart. In house 6 8 or 12. Debilitated or in enemy sign.	0 60 180 $\pm 4^\circ$ to VE or JU. Exalted or own sign in navamsa chart. In house 1 4 5 9 or 11. Exalted or in own sign.

House rulers are planets and much the same rules apply as above.

House is	Occupied by MA SA Rahu or Ketu. Occupied by ruler of house 6 8 12.	Occupied by VE JU or MO. Occupied by ruler of house 1 4 5 9 11.
-----------------	---	--

A negative rule may or may not apply to a particular chart, but if it does then its occurrence in the Yes group should differ from its occurrence in the No group according to the actual life experience (positive or negative) of the chart's owner. And the same for positive rules.

As well as being positive or negative depending on the rule, planets have a variable strength determined by sidereal sign position and rulerships, here quantified by multiplying together arbitrary weights based on tradition. Since the weights are applied to both sides and only for making comparisons their exact value is of little consequence. Some example weights:

If **positive**: 2 if exalted within 4° , 1.5 ditto but not within 4° , 1.25 if in own sign, otherwise 1. Total weight **W+**.

If **negative**: 2 if debilitated, 1.25 if in an enemy sign, 0.5 more if retrograde, otherwise 1. Total weight **W-**.

Tests

Despite the general agreement on rules there is no general agreement on which particular factors (planet, house ruler, house) should be used for predicting things like cancer, so every factor was tested. The means for each opposite group (Yes, No) for each factor and each rule (positive, negative) were then compared via two-sample t-tests using two distinct measures:

Number of rules: For each factor, the percentage of positive rules that was applicable for each factor in the Yes and No groups, and the same for negative rules. For example if the rule for Jupiter required it to be exalted and it wasn't, the rule was not applicable and was therefore not counted. If the average of the 9 negative rules that were applicable was Y in the Yes group and N in the No group, the percentages compared by the t-test were $100 \times Y/9$ and $100 \times N/9$, with of course the corresponding standard deviations and sample sizes needed for the test.

Compliance scores: This was a more elaborate comparison using scores to measure the actual magnitude of the applicable rules instead of the simple mean number used above. For **negative** rules the compliance score was 0 if the rule was not applicable. Otherwise the score was $-20 \times (W- \text{ for planet A}) \times (W- \text{ for planet B}) \times \dots$ for all planets involved in the rule. For **positive** rules the compliance score was 0 if the rule was not applicable. Otherwise the score was $+20 \times (W+ \text{ for planet A}) \times (W+ \text{ for planet B}) \times \dots$ for all planets involved in the rule. The multipliers -20 and $+20$ created a more convenient scale and did not affect the resulting t value.

Birth charts were calculated by commercial software using the Lahiri ayanamsa and analysed by custom software that applied the rules (this part was fully automated) and statistical tests. Data collection, rules and their analysis required ten years of dedicated development.

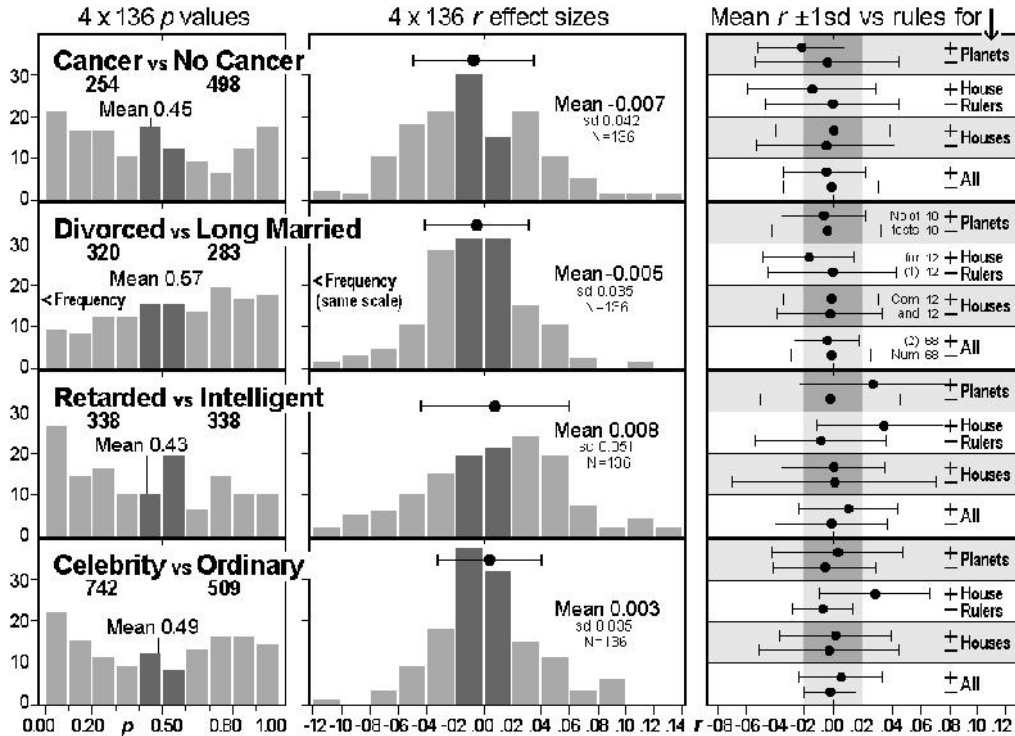
Results

As an example the results for Venus (traditionally associated with marriage) in the Yes vs No groups (*divorced* vs *long married*, where *long married* means married before age 30, never divorced, never separated, and never widowed) were:

	Rules	Yes N=320	No N=283	t	p of difference	r
Number of rules	Positive	35.16%	35.57%	-.2855	0.78)	-.012
	Negative	20.52%	21.28%	-.6792	0.50) by	-.028
Compliance scores	Positive	+40.4	+40.4	0.0100	0.99) t-test	0.0004
	Negative	-48.6	-51.2	0.8305	0.41)	0.034

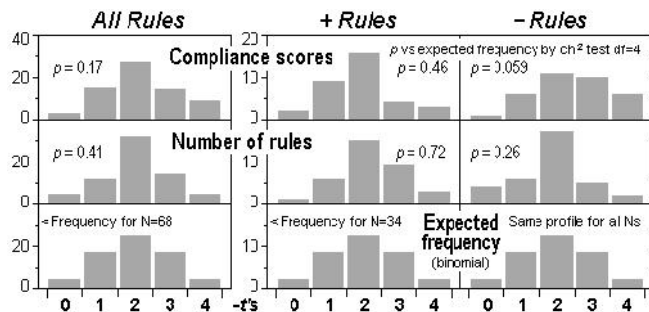
Despite involving the most likely planet, the r values (calculated by us via $r = t / \sqrt{t^2 + N - 2}$, see 8.2.1) are essentially zero, and no p value is even marginally significant. The % number of rules tended to reflect the compliance scores, so their results below have been combined. When applied to the relevant factors, ie 10 "planets" (Ascendant, SO through SA, Rahu and

Ketu), 12 house rulers, 12 houses, each pair of opposites generated $34 \times 2 \times 2 = 136$ comparisons, 136 t -tests, 136 p values, and 136 r effect sizes, which when plotted looked like this:



Each row of plots tests Vedic factors with exactly opposite groups to see if Vedic astrology can tell the difference. **Left:** In each set the distribution of 136 p values from tests of 136 differences has a mean close to 0.5 (ie exactly chance). For 3 factors $\times$ 2 tests (compliance, numbers) $\times$ 2 directions (+, -) = 12 distributions, mean p is 0.482 sd 0.052, which (as in p -curve see 7.7.2016.3.1) shows zero support for astrology. **Middle:** In each set the distribution of 136 r effect sizes is more or less symmetrical about means that are never usefully different from zero (indeed, the mean of all 544 effect sizes is -0.000 sd 0.028). So Vedic astrology cannot tell the difference between these exactly opposite groups. The small differences in skew could be caused by fast-moving planets being more uniformly spread over charts than slow-moving planets. (In Western astrology a larger skew due to self-attribution might be possible – its r is typically 0.06 see 8.3.7 – but not here as Vedic factors are too complex to be easily remembered.) **Right:** The mean effect sizes for Vedic rules are mostly between -0.02 and $+0.02$ (shown shaded) whether grouped by planet, house, house ruler, or rule (+ or -). No factor is consistently more positive or less scattered than another. An effect size of $+0.02$ (or -0.02) is equivalent to getting one Vedic reading in every 100 better (or worse) than tossing a coin.

Comment The above tests *within* groups could conceivably miss individual rules that behave consistently *between* groups, so Vedic astrology could still work. We must take a closer look:



If each individual rule is tested against the four opposite groups combined, the counts (0-4) of negative or positive t -values (either will do) will indicate how consistent it is. Even if only a few rules are valid, the distribution of counts will differ from the distribution that is expected by chance especially in the tails (ie only 0s or 4s) where consistency will be at its most visible. But the plots of frequency vs t -number of negative t values provide no significant support for such an effect.

End of comment

In other words Vedic astrology does not react – even slightly – to the most extreme afflictions that humans can experience. It is simply inert. None of the results were improved by including Western factors such as UR, NE, PL that Vedic astrology rejects. The authors conclude:

Vedic astrology does not pass through these empirical tests and does not have the merit of predicting the effects of life. ... The response of astrologers to such a test is usually "never say die" [ie they keep on arguing] and they continue

to come up with hundreds of new rules that we have not tested. Which we can always test ... if they give us a single list of rules as the ULTIMATE TEST ..., [but they] must explain why none of the entities [here called factors, ie 10 planets + 12 house rulers + 12 houses] could show any difference ... in any of our experiments (from website).

Comment Dr Rajopadhye and his associates have produced a set of studies as good as any in Western astrology and have confirmed the value of testing exactly opposite groups. The areas studied could hardly have greater impact on people's lives, and the results seem unlikely to be challenged (at least factually) by tests of other areas or of astrologers, which leaves Vedic astrology with no sure grounds for relevance other than its historical significance. Replications are planned by Dr Rajopadhye even though their relevance (which of course is automatic if results seem positive) becomes less urgent when the results are so consistently negative.

One Vedic hazard for the unwary is that many Indian journals with impressive titles can be remarkably uncritical about astrology. For example a series of articles by Ashish Chauhan (a PhD in chemistry and a member of the Indian Council of Astrological Sciences) in the *Indian Journal of Psychotherapy & Psychological Disorders* during 2014-2020 summarise as a "research analysis" what Vedic astrology books say. He presents no empirical tests and concludes:

Astrology ... is highly scientific ... and has immense potential for human welfare (from 6(7), e5455, 2020, 3rd page). But without empirical tests why should anyone believe this? Not usefully better is a paper by KP Subedi et al, Medical and Astrological Study on the Impact of Celestial Bodies for Cancer-Susceptibility – a Case Study, in the *Indian Journal of Emerging Technologies and Innovative Research* 6(6), 194-200, 2019. The authors' hypothesis is a sweeping one:

As light shows the objects lying in the darkness so does astrology predict the person's future activities (p.194).

Their test sample was 20 patients attending a cancer hospital in Nepal. But their paper contains no birth data, no charts, no opposing indications, and no controls to show the result was not merely the picking of matching indications from ample possibilities, like picking a named card from a pack spread face up.



Also RP Bhandary et al, Prediction of Mental Illness using Indian Astrology: Cross-Sectional Findings from a Prospective Study, in the *US Journal of Scientific Exploration* (expelled from Scopus abstract database in 2018 for poor quality) 32(3), 555-578, 2018. Bhandary (pictured) begins:

The basis for astrological prediction often appears illogical, unscientific, and undemonstrable in today's world. However, [in India] astrology still persists because it provides a coherent and comprehensive system of thought and gives an explanation for why each human being is different from all the others. And astrology forms one of the predominant treatment methods in India during mental illness (p.556).

They tested 75 subjects with mental illness (24 depression, 17 bipolar, 16 anxiety, 15 psychosis, 3 other) and 75 without, all from the Kasturba Medical College in Manipal 800 km south of Mumbai with "knowledge of their accurate time, date and place of birth" (whatever that means). The groups were matched for sex (52 f, 48 m) and age (both means 32 sd 13).

Four astrologers volunteered to be tested. Each had at least five years experience in reading birth charts, had published articles or books on astrology, had a Bachelor's degree in Indian Astrology, and were curious to know the results. All were blind to the mental diagnoses. To allow their agreement to be measured, each astrologer received the same 10 charts (4 ill, 6 not ill). Otherwise each received respectively 38, 37, 37, 28 unique charts not shared with another astrologer, making a total of 150 charts. Birth charts (calculated by commercial software) were identified only by a number 1-150. The judgements required and results were:

Judgement	Clinic	Astrology		Effect size	
	Yes/No	Yes	No	phi	p
Not currently ill but ever been ill?	Yes	58	17	0.560	0.000,000,000,021 (reported as 0.001)
	No	16	59		
Currently ill?	Yes	59	14	0.626	0.000,000,000,000,060 (reported as 0.001)
	No	14	63		

Type of illness	Yes	26 hits/75	◀ Reduced to 3 types (not clear how)
Month and year of onset	Yes	21 hits/75	◀ A 3-month margin was allowed
Agreement on ever been ill		0.267	p 0.019
on currently ill		-0.111	p 0.805

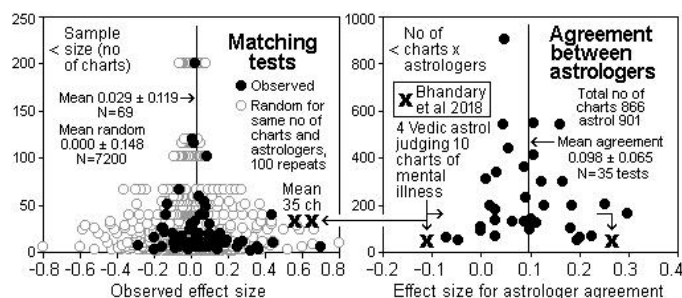
Because both agreement and effect size are measured as a correlation, the maximum possible effect size is the square root of the agreement. Because judges can agree but still be wrong, the result can greatly overestimate the effect size actually observed. Here the *overestimated maximum* effect size for judging *ever been ill* is $\sqrt{0.267} = 0.517$, which is awkwardly *less* than the observed 0.560; while the 0.626 for judging *currently ill* is not plausible if the agreement is -0.111. The study should have stopped at that point to resolve credibility. Later it should have published each astrologer's results as essential to resolving the problems. But it did neither. It also ignores Narlikar et al's large-scale test of Vedic astrologers published 9 years previously which found no ability to judge mental retardation. Too awkward? But there is more:



Each chart consisted of a page listing birth data and ID, plus 6 more like these showing from left Vedic natal chart, 4 harmonic charts, house positions, sensitive degrees, periods and sub-periods with dates showing when they are effective and in what way. All with no explanations.

The article provides equally incomprehensible (to Western readers) pages on Vedic methods, much irrelevance such as details of astrology courses (p.560), but few details of procedure, thus making the study impossible to assess. Yet Bhandary et al conclude their results are:

possibly the best obtained through research so far (p.567). Overall ... the evidence seems to point towards astrology as practiced in the study modestly predicting the presence of mental illness (p.570).



Comment But were the results of Bhanary et al results really the best obtained so far? To find out, we can insert their results into the previous results of 8.6.3 & 8.6.12. ◀ The answer is No. Indeed, their problems with agreement (partly shown on right) disqualify their results from serious consideration.

7.8 INDIVIDUAL STUDIES: SUMMARY of sections 7.1–7.7.

Before we start, consider this sure-fire recipe for becoming an astrologer:

- Read sun sign books, learn more, calculate charts, see how they seem to work.
- Become dazzled by the history, majesty, and sheer appeal of it all.
- Accept clients, then defend astrology against attack to avoid cognitive dissonance.

Cognitive dissonance is what you feel when evidence contradicts your cherished belief. It is so unpleasant that most people find reasons to reject the evidence. In astrology classes students are told to try astrology for themselves, which seems entirely reasonable. But what they are not told is the evidence as in this chapter. Their teachers are reacting to cognitive dissonance.

This chapter has provided more than 500 summaries and nearly half a million words involving a total of more than 700 individual studies covering a huge diversity of topics (chart factors, application issues, conference reports and surveys, tests of events, Gauquelin results, personality, general research issues including philosophical issues), most of them concerned with outcomes that are objective and testable as opposed to outcomes that exist only as personal opinions and untested experience (areas to be looked at in 8.9 and chapters 9 and 10).

The above studies have asked serious questions of astrology, such as whether people with X in their charts are more X-ish than people without X in their charts, and whether astrological

claims may have explanations other than astrological ones. Together with the studies in the next chapter they probably represent over 100,000 man-hours of dedicated research by both astrologers and scientists. But despite this massive effort, nothing has been found that would justify the allocation of scarce research money or resources for their further investigation.

But this outcome is not for want of trying. If there was something there, it would surely have been discovered by now, and (as in self-attribution) scientists would be rushing to explore this new challenge. Astrologers tend to dismiss such a view and claim astrology cannot be tested by science, which is contradicted by their many assertions in 4.1.3 (essentially "trust your experience") simply because an astrology not testable by science is not testable by experience either. So they could never know what they are talking about. They cannot have it both ways.

In a last-ditch clutching-at-straws stand to support anti-science views, astrologers might of course use examples like the following to show how science is merely a glaring conceit:

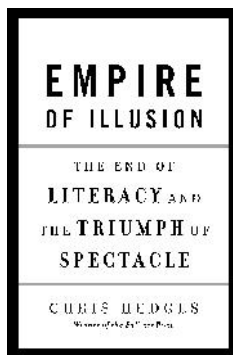
1932. There is not the slightest indication that nuclear energy will ever be obtainable. It would mean that the atom would have to be shattered at will (Albert Einstein).

1943. I think there is a world market for about two computers (Thomas Watson, Head of IBM).

1956. Space travel is utter bilge (Dr Richard van der Riet Woolley on becoming Astronomer Royal).

But quoting them to discredit science is to ignore context. Once atoms could be shattered at will, Einstein was proved right. Computers in 1943 were as big as a house and cost millions of dollars. Space travel was no longer bilge when rockets able to leave Earth were developed.

In any case quoting them to discredit science is to ignore science's demand for empirical evidence and replication, to say nothing of the cases (like not putting wet fingers into power outlets) where it is wise to believe. This applies especially to modern educated Americans, where only a minority living in a literate print-based world can cope with complexity while the majority retreats from a reality-based world into one of false certainty and magic:



A third of [American] high-school graduates never read another book for the rest of their lives, and neither do 42 percent of college graduates. In 2007, 80 percent of the families in the United States did not buy or read a book (p.44). ... The more we sever ourselves from a literate, print-based world, a world of complexity and nuance, a world of ideas, for one informed by comforting, reassuring images, fantasies, slogans ... the more we are destined to implode (pp.189-190) (Chris Hedges's Pulitzer Prize-winning *Empire of Illusion: The end of literacy and the triumph of spectacle* 2010). See also astrology on the internet 7.2.1996.1.

Are we now in danger of returning to earlier times when there were two truths – one prescribed by the Church and the other revealed by nature and observation, except the first may now be prescribed by Astrology? Will there be continuing outbursts against clergy (now disguised as astrologers) like this one against the clergy of a thousand years ago:

Ignorant themselves of the forces of nature and wanting to have company in their ignorance, they don't want people to look into anything; they want us to believe like peasants and not ask the reason behind things. ... If they learn that anyone is so inquiring, they shout out that he is a heretic, placing more reliance on their monkish garb than on their wisdom (French philosopher William of Conches 1100-1154, quoted by DE Duncan, *The Calendar* 1998:202).

The answer at this point is unclear, simply because we have been looking at individual studies that are mostly one-offs that either do something differently or they test something different. Which is problematic because in science no result can be taken seriously unless it has been replicated by several independent observers. Until this happens there is no guarantee that an isolated result is not due to: (1) faulty procedures, (2) variables other than the one being tested, (3) chance regardless of the observed *p* value, (4) bias or cheating or vested interests.

The answer is also unclear because individual chart factors are said to mean little compared with the testimony of the whole chart. So before proceeding further we must bring together all studies relevant to a particular theme to see what their collective testimony is.

This we do in the next chapter, starting with a reminder of the state of early research.