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Clearing the Logjam in Astrological Research

*Commentary on Geoffrey Dean
and Ivan Kelly's Article 'Is Astrology
Relevant to Consciousness and Psi?'*

Abstract: *Two of the staunchest critics of astrology presented their case in an article published in this journal (2003) that has since become a standard reference. The authors argue that the astrological experience is more likely to work by 'hidden persuaders' than by either objective or psychic criteria, yet their argument provides no evidence of this. The authors demand careful testing yet their own examples and claims against astrology are not careful. The meta-analysis claim mixes studies with widely disparate data types. The parental tampering argument against Michel Gauquelin's planetary eminence findings lacks supportive evidence. The 'definitive' time twins test fails to define the criteria of resemblance. The test of predicting psychological test profiles does not discriminate between permanent personality dimensions and psychological states as astrology requires. The blind chart matching studies evaluated skills on the wrong parties where they would not be expected by either astrology or psychology. The authors fail to mention the most interesting and promising peer-reviewed astrological research studies that were available to them. Improved discourse with astrological subject matter experts is recommended.*

Despite the title of their article, 'Is Astrology Relevant to Consciousness and Psi?' (herein referred to as 'the article' or 'D&K'), Geoffrey

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Dean and Ivan Kelly deliver a general critique of astrology without much regard for consciousness or parapsychology (psi). I agree that astrology needs expert criticism and that astrological research demands continual improvement. Yet Dean and Kelly's arguments do not regard astrological concepts and theories with any seriousness. My reply to their article aims to point out weaknesses and errors that the authors should have avoided.

A critical reply is desirable considering that, since it first appeared in 2003 in the *Journal of Consciousness Studies*, the article has become a standard reference. It now returns more than 50,000 results for a Google search of the title as an exact phrase. Google Scholar lists 42 citations. The current Wikipedia articles on 'Astrology' and on 'Astrology and Science' reference the article six times. Because Dean is a former professional astrologer and carries influence as an authority on the subject, critical review of his widely available views and arguments should not be neglected if objections are warranted.

Dean and Kelly's article is divided into two halves. The first half appears to be mainly Kelly's contribution while Dean's style is dominant in the second half.

1. Kelly's Arguments

1.1. Shamanism, Psi, and Fantasy

Finding relevance between astrology and parapsychology is a challenge. Kelly remarks that, 'Astrology has one sure thing in common with parapsychology — a highly visible outpouring of market-driven nonsense' (D&K, p. 175). Yet compared to our daily exposure to advertising influences of all descriptions, this guilt by association barely registers at all. Kelly intends to be fair and says he will favour 'serious astrology'. By this we might expect Kelly to refer to the astrological corpus and draw upon the most reputable authors. Astrology is a discipline with notable authorities, courses of study, and diplomas. By comparison psi does not have a similar corpus or accreditation and unlike astrology it relies upon native gifts. Yet psi is an acknowledged field of scientific interest and researchers devote considerable time and effort to its study. Kelly attacks the relevance of astrology to ordinary consciousness, in which he includes scientific method, and suggests its relevance instead to altered consciousness.

Kelly quotes renowned British astrologer Charles Carter who stated in his book *The Principles of Astrology* (1925) that 'Practical

experiment will soon convince the most sceptical that the bodies of the solar system indicate, if they do not actually produce, changes in: 1. Our minds. 2. Our feelings and emotions. 3. Our physical bodies. 4. Our external affairs' (p. 14). Kelly shifts from 'practical experiment' to 'practice' and a different meaning, 'But after twenty centuries of practice, astrologers still cannot agree on what a birth chart should contain, how it should be interpreted, or what it should reveal' (D&K, p. 176). Yet, as readers of astrological textbooks can confirm, astrological content and interpretations are much more often in agreement with each other than contradictory. Kelly has not made a proper assessment of the practice and his claim is unwarranted.

Carter's optimism requires understanding and cooperation among all researchers. Environmental and lifestyle factors, such as those described in astrology, are easily underrated yet can shape an individual's personality and habits in ways that are difficult to assess in other disciplines. An experimental evaluation of astrologically conceived environmental influences should more realistically be regarded as no less challenging than psychologically conceived evaluations of innate personality.

We should expect Kelly to draw upon the corpus of astrological counselling and best practices, but Kelly is interested only in astrologers who claim to use, or who appear to him to use, psychic abilities. Kelly ignores Carter's view on this issue, which appears on the same page as the practical experiment statement, 'Astrology does not involve any form of psychism, and is founded upon mathematical and astronomical data, interpreted according to general principles' (Carter, 1925, p. 14).

Kelly thinks that astrological divination as described more recently by British astrologer Geoffrey Cornelius in his influential book *The Moment of Astrology* (1994/2003) suggests a connection to psi. Kelly suggests that psychic processes work even where astrologers do not claim psychic ability yet demonstrate remarkable insights while interpreting natal charts by the written literature. Kelly's argument covers four stages: 1) Trace the consciousness responsible for the astrological experience; 2) Determine whether the experience is 'something unusual happening' (paranormal); 3) Compare the experience with 'best hits' familiar in psi research; and 4) Identify factors that could explain the experience.

To argue Stage 1, Kelly uses the example of horary astrology, described by Cornelius as an example of divination. In horary practice, the astrologer sets up a chart for the moment and place when

the client (querent) poses a question to be astrologically judged. That moment could be when the astrologer understands the question, for example by reading it in a letter. From this example of a letter, Kelly argues that the 'horary birth (*sic*) chart does not exist until the astrologer becomes consciously involved by receiving the question' (D&K, p. 176) and the querent has no conscious connection to the moment used for the chart.

Kelly fails to consider the antecedent of the horary moment. The involvement of the astrologer does not, as Kelly implies, divorce the chart from the querent's urge of posing the question and allowing a judgment to be made. Similarly, the judgment of a bank clerk does not divorce the clearing of a cheque from the person who wrote it. As Cornelius explains, the querent's conscious 'will-to-inquire' establishes the root basis, which he calls the 'radical intent', that associates with the chart and makes it valid (Cornelius, 1994/2003, p. 107). Because there is an intended interaction with the astrologer, the consciousness of the querent necessarily includes the astrologer's involvement in the timing of the chart.

Kelly seizes on to Cornelius's description of chart reading as a 'ritual' and a 'divination' to suggest that the astrologer's judgment is neither an interpretation of astrological theory nor a psychic 'gift of nature' but is a product of the astrologer's mental state.

The actual involvement of the astrologer, as opposed to being a mere interpreter, suggests that astrological 'connections' are less a gift of nature and more a product of the astrologer's mind... In this 'all in the mind' view of astrology there is nothing actually 'out there' that involves planets... The technique used for reading the chart is then merely a ritual that leads to the right mental state. (D&K, p. 177)

This rationalization begs a question. If the mental state that produces the astrological experience is neither conscious (arising from the interpretation of theory) nor unconscious (arising from the gift of psi), then what mental state is Kelly referring to? Arguing that the astrological connections are 'all in the mind' does not resolve this quandary.

Kelly ignores the distinction that Cornelius makes between the significance of human radical intent and the 'unbidden' significance of traditional theory. These two essential components of significance 'overlay' each other during consultation to bring theoretical particulars into focus (Cornelius, 1994/2003, pp. 132–4). What Cornelius seems to describe is a process whereby astrologers deliberately inject astrological theory into client interactions as an organizational and capacity building process that is helpful to the clients.

Instead of this fairly normal process, Kelly suggests a paranormal resolution to his quandary, which he supports in Stage 2 of his argument by making vivid associations. He suggests that some astrologers routinely enter into altered states of consciousness and this makes the experience of reading a natal chart quite unlike reading any other type of map. Kelly makes an analogy to the 'frenzied dancing, drumming, and mushroom-eating used to attain shamanistic consciousness'. To Kelly, the symbolic complexity of the chart is 'almost without limit', and may require 'the aid of psi to sort out the confusion' (D&K, p. 177).

After this stunning impression, Kelly retreats, 'For many astrologers a chart reading involves no more than ordinary concentration, so "shamanistic consciousness" hardly applies to them' (*ibid.*, p. 177). Yet he persists with a more subdued argument to look for exceptions, 'But for others it is different'. He speculates that some chart reading skills might arise 'merely from a fantasy-prone personality (one that fantasizes vividly during much of waking life)... But proneness to fantasy seems to be an essential ingredient of shamanism' (*ibid.*, p. 178).

Although Kelly admits that psi and altered consciousness are not prominent concerns for ordinary astrologers, he builds his case in Stage 3 by finding exceptions and comparing them to psychic abilities and psychic research.

Kelly quotes psychic researcher Alan Vaughn, 'My own small experience with astrologers has given me the impression that their best hits are psychic rather than astrological, though in truth it is very difficult to separate the one from the other' (D&K, p. 180). Assessing the accuracy of psychic 'hits' plays a dominant role in psi research. Kelly quotes some astrological authors, mediums, and psychics who say that some form of psychic ability or ESP is useful or even necessary to provide specific details in astrological readings (*ibid.*, p. 180). He does not quote any authors from the astrological corpus who have written specifically on counselling and practice and would be the most reliable sources of information. Notable authors whose work was available to Kelly are psychiatrist Bernard Rosenblum (1983), psychologists Maritha Pottenger (1982) or Noel Tyl (1977), and astrologers Christina Rose (1982), Donna Cunningham (1994), or Stephen Arroyo (1984). None of these reputable authors mentions anything about making impressive hits or about the use of psi in working with clients.

1.2. *Hidden Persuaders*

Kelly finds some examples of perfect hits in Garry Phillipson's book of interviews with astrologers and sceptics, *Astrology in the Year Zero* (2000). The examples Kelly uses are by Robert Zoller, who described abuse at age thirteen from a natal chart, and by John Frawley, who described the location of a shawl lost in a French restaurant by using a horary chart (Phillipson, 2000, p. 71). These examples prompt Kelly to remark that, 'Such hits lead to the claim that astrologers proudly and repeatedly make, that astrology is unassailable because it is based on experience' (D&K, p. 180).

Firstly, on the same page, Phillipson refutes Kelly's remark as if he anticipates it, 'As an aside, reeling off a list of successes in such fashion may create the impression of boastfulness on the part of an astrologer, but such an assessment would be unfair. Getting this kind of detail from John Frawley and other astrologers was a bit like drawing teeth' (Phillipson, 2000, p. 71).

Secondly, Kelly's remark implies that reading *what the chart says* with impressive hits in oracular fashion to passive clients is the essence of the astrologer–client relationship and provides what clients want. Yet the leading authors on astrological counselling speak against this. Tyl warns astrologers against the 'original sin' of pressures from their own egos that result in 'one-sided performances' that 'prevent sharing, corroboration, learning and profitable counsel' (Tyl, 1977, p. 4). Rosenblum warns against the 'persistent difficulty inherent in the astrologer–client relationship' where client 'expectations of magic' can lead to excessive dependency on 'apparently mysterious sources and without effort on the part of the client' (Rosenblum, 1983, p. 20). Rose warns that 'people do not want to be merely interpreted, classified and disassembled... There is an individual behind every birth chart who wants to be understood and reach new realizations and awarenesses' (Rose, 1982, p. 17).

Thirdly, Kelly's remark alleges that astrologers claim 'astrology is unassailable because it is based on experience [of perfect hits]'. Kelly says this sentiment 'echoes' his opening quote from Charles Carter (D&K, p. 180). On the contrary, the quote says that 'practical experiment [not experience] will soon convince the most sceptical'. Nor is it a statement of unassailability. Carter does not say that astrology is based on experience, but rather that it is 'founded upon mathematical and astronomical data, interpreted according to general principles' (Carter, 1925, p. 14). Like any discipline with a corpus of theory and

practice, astrology would have no basis without the corpus and the astrological experience would not exist. When an astrologer says that in their 'experience' astrology works, they only mean that it is useful as a tool and not that the reliability of astrology is based on their experience of using it. Later, Dean makes the same allegation calling it 'personal validation'.

By making unsupported allegations, by generalizing from exceptions, by exaggerating claims, and by ignoring the corpus, Kelly characterizes the astrological experience as being nothing more than a variation of psi and thus is subject to the same arguments that he would use against psi. He argues that the astrological experience is actually based on non-psychic influences that he calls 'hidden persuaders' (Stage 4).

But the claim [of unassailability that Kelly alleges astrologers make] is untenable because astrologers are generally unaware of the many hidden persuaders that can make them see hits where none exist. Examples are the Barnum effect (reading specifics into generalities), cognitive dissonance (seeing what you believe), cold reading (let body language be your guide), nonfalsifiability (nothing can count against your ideas) and operant conditioning (heads you win, tails is irrelevant). There are many more. Technically these hidden persuaders can be described as 'statistical artifacts and inferential biases'. (D&K, p. 180)

All of these 'hidden persuaders' are quite familiar to experienced astrologers and could more properly be called 'counselling alerts'. Distressed clients in consultation often jump to hasty conclusions. They rationalize to avoid discomfoting realities. They unwittingly leak revealing clues about themselves. They trap themselves in always/never absolutes. They persist in bad habits despite obvious signs of trouble. All of these alerts are to be expected and none of them make astrological theory untenable as Kelly claims.

Kelly provides no justification for his claim that astrologers are 'generally unaware' of these 'hidden persuaders', which should also include the placebo effect and confirmation bias. Indeed, it would be negligent for anyone in the helping professions, including astrologers, to ignore breaking the ice with generalities leading to specifics or to ignore 'cold reading' a client's body language. Pottenger explains the usefulness of gaining 'deeper forms of empathy' through the 'universal process of counseling', such as mirroring body language and establishing non-verbal rapport (Pottenger, 1982, p. 91).

To clench his claim of hidden persuaders, Kelly argues that it is 'not uncommon' for astrologers to make an apparently successful chart

reading only to discover that they had mistakenly used the wrong chart. Such occurrences have been documented and they raise valid questions about a potential placebo effect, as sometimes happens for example in medicine and in court proceedings. However, simply pointing to anecdotal reports of successful wrong chart readings does not justify Kelly's claim that astrologers 'ignore the logical conclusion... that astrology is dominated by hidden persuaders, so any chart will do' (D&K, p. 181n). A more reliable conclusion can be made by testing whether respondents would rate wrong chart readings as accurately as a genuine chart reading where the respondents can compare the two. A famous double-blind study of this type by researcher Shawn Carlson was published in *Nature* in 1985, but neither Kelly nor Dean mentions it. We'll look into this later.

2. Dean's Contribution

2.1. Correspondences

Since Geoffrey Dean and Arthur Mather's publication of their book *Recent Advances in Natal Astrology* (1977), Dean has been the pre-eminent investigator of statistical research in astrology. Dean's early acceptance of statistical methods contrasts with the oft-repeated but faulty argument that astrological evidence cannot exist because no sufficient causal mechanism explains it. Although mechanisms are good to have, science does not require them. For more than a century, the methods of statistical inference have led the way in science and have provided highly reliable, highly practical information. Geoffrey Dean has been instrumental in establishing a much needed common ground of discourse between science and astrology.

In the article, Dean begins his arguments by claiming that astrology cannot be true because it is based on the Principle of Correspondences. As an example of correspondences, Dean says that because Mars is visibly red, this is how it originally became associated with blood and war. Dean says this superficial connection makes astrology 'untenable' and 'like believing in fairies' (D&K, p. 183). Dean seems unaware of critics who have already refuted this argument. Attacks on the supposed genetic origins of astrology do not demonstrate whether

the claims themselves are valid or invalid.¹ The ridicule Dean seems to add is unwarranted.

A further problem is that Dean confuses dissimilar concepts that require clarification. Dean gives no astrological source for the Principle of Correspondences. *The Kybalion* (1908), an anonymously written yet influential book on Hermetic Philosophy, describes this principle as what is more commonly known among astrologers as the Hermetic Maxim, ‘As above, so below’, which dates from at least the Emerald Tablet (c. 600–800 CE). The Hermetic Maxim is a mathematical and holistic concept that is widely regarded as a true organizing principle of astrology. It refers to process symmetries believed to naturally occur between microcosms and the macrocosms that contain them (McRitchie, 2004).

However, the Hermetic Maxim is not the target of Dean’s argument. What Dean appears to refer to is the non-astrological Doctrine of Signatures used in early herbal medicine that holds that every plant has a pattern that resembles a body organ or physiological function that signifies its medical benefit. For example: kidney beans associate to kidneys, walnuts (high in fatty acids) to the brain, liverwort to the liver, eyebright to the eyes, and sweet potato (known to improve blood sugar levels) to the pancreas (Grieve, 1931/1971; Stori, 2012).²

The association of planetary properties to their astrological properties that Dean mistakenly calls the Principle of Correspondences are generally used only to teach astrology. These are simply heuristic or mnemonic devices that may have nothing to do with the origins of the astrological properties themselves. The same idea was likely also the intent of the herbal Doctrine of Signatures, which is consistent with learning in preliterate societies. Typically, astrologers

¹ A very similar claim to Dean’s was made by astronomer Lawrence Jerome in his book, *Astrology Disproved* (Jerome, 1977, pp. 27, 70). This claim was criticized by psychologists H.J. Eysenck and D.K.B. Nias in their book, *Astrology: Science or Superstition?* (1982): ‘It is not enough to say that astrology originated as a system of magic and as a result cannot be valid... The primary assumptions of a theory do not automatically prove or disprove its results’ (p. 10). In an earlier but similar criticism, Carl Sagan (1976), in his letter to *The Humanist* on his refusal to endorse ‘Objections to Astrology — Statement by 186 Leading Scientists’ (Bok, Jerome and Kurtz, 1975), argued, ‘The fundamental point is not that the origins of astrology are shrouded in superstition. This is true as well for chemistry, medicine, and astronomy, to mention only three’.

² Historically, indications of medical conditions and diseases were associated with the astrological taxonomy because astrology had the earliest, most clearly defined, and most widely understood, classification system available.

claim that astrological properties are based on centuries of documented observation and practice, as suggested earlier in the quoted statements by Carter.

2.2. *Neglect by Psi Researchers*

Because of the article's title, Dean needs to say something about consciousness and psi, and he asks, 'Why has astrology been neglected by psi researchers?' He asks psi researcher Carl Sargent, but oddly enough Sargent does not describe a psi research programme, which would normally test the ESP performance of individuals. Instead, Sargent describes how astrological theory could be tested by using standard regression techniques.

For a sound research programme which does justice to the complex and dynamic interplay of horoscope factors which traditional astrologers emphasise, it would be necessary... to poll astrologers on which predictor variables would best predict a limited range of criterion variables (e.g., extraversion, aggressiveness, manifest anxiety)... and use multiple regression techniques... At present such a research programme has not been implemented. (D&K, p. 184)

Based on this quote, and a quote disparaging astrology from another psi researcher, Dean concludes, '...the neglect of astrology by psi researchers might or might not be justified' (*ibid.*, p. 184). This conclusion does not answer or even clarify Dean's question or the reason for the article. Dean simply evades the entire issue of consciousness and psi and apparently follows his own agenda.

Evidently, Sargent's quote lets Dean introduce his view that such a full-blown research programme is not necessary. He says, 'Thanks to advances in research, that situation no longer applies' (*ibid.*, p. 184). Although Dean supports statistical research in astrology, his claim is extraordinary because it departs from the normal methods of research that Sargent recommends.

2.3. *Meta-analysis*

Dean claims to have assessed the results of over 500 astrological experiments, although he admits that 80% of these studies are 'generally unknown'. He claims his findings, which are all negative against astrology, have 'revolutionized our understanding of astrology'. He is quite dismayed that his assessment has had 'little effect' on astrologers. He says the reason for this is 'simply because astrologers rely solely on experience, or what psychologists call "personal

validation”’. He is equally dismayed that interviews with thirty leading astrologers (Phillipson, 2000) found that ‘Many (not all) regarded scientific studies to be misguided’ (D&K, p. 184).

Dean’s research method is to take the 500+ results of astrological experimentation as a whole, whether flawed or not, and use meta-analysis to evaluate statistical effect sizes. Dean says this method can ‘subtract the sampling and measurement variability (something not possible with an individual effect size) to see if there is a genuine residual effect’ (*ibid.*, p. 185).

Meta-analysis is an important data research tool. It can graphically plot and evaluate the effect sizes of multiple related tests. For example, on a numerical scale 0 could represent the null hypothesis value (no experimental effect) and effect size could vary from -1 (strongest negative) to $+1$ (strongest positive). This can help to identify interesting patterns in the effect size of data compared to its theoretical probability distribution. A weighted average for the observed effects can be compared to the null effect to see if there is a significant difference.

However, like any research technique, meta-analysis works better in some applications than others. It works well in large-scale mature research programmes that are based on robust regression testing such as clinical drug trials. In contrast, current astrological experimentation is still hampered by the delicate process of identifying and rejecting artefacts and errors. These can range from ignorant blunders and misunderstanding of theory to seemingly intentional and highly deceptive sampling errors.

The discovery and resolution of methodological issues is critically important in the early stages of any research programme and statistical research in astrology is still in its infancy. As Dean himself emphasizes, ‘Artifacts in astrology, just as in parapsychology, can be surprisingly subtle and resistant to detection, compared to which the everyday hidden persuaders are child’s play’ (*ibid.*, p. 185). The use of meta-analysis to remove sampling and measurement variability does not cause major artefacts and errors to magically disappear or become irrelevant. The majority of Dean’s sample of 500+ experiments may not even be within the ballpark.

Although Dean does not show any examples of meta-analysis in the article, his recent co-edited book *Astrology under Scrutiny*, herein referred to as *AuS*, shows some of the experiments and some of the

data (Heukelom, Dean and Terpstra, 2013, pp. 354–5).³ British astrologer Robert Currey has made a detailed review, exposing textbook examples of problems that demonstrate the unreliability of Dean's analysis. For example, a meta-analysis must correspond to the claims associated with it. For example, if the claim is about Western astrology, then Dean should not include non-Western studies, such as Chinese astrology (Currey, 2014, p. 56). If the claim is about astrological theory then Dean should not include studies for which there is no theory, such as the New York Suicide Study (Press *et al.*, 1977; Currey, 2014, p. 58; Hand, 2008, p. 44).⁴

In one striking example in *AuS*, Dean arbitrarily copies the largest astrological effect sizes from one side of a distribution to the opposite side to remove what he estimates to be a 'publication bias' (Heukelom, Dean and Terpstra, 2013, p. 223). The inference is that high effect sizes are automatically artefacts. In Dean's view, astrology demonstrates little or no effect, and when a significant effect is evident, he discounts it as publication bias, thereby suppressing the most relevant evidence.

As a whole, astrological research has very few examples of excellence, but they do exist and they can serve as models to improve the research methodology. Instead of relying on meta-analysis, the better technique is to use regression testing to remove artefacts and improve significance, as Sargent (D&K, p. 184) suggested. This method is more likely than meta-analysis to lead to better observations and ways to ramp up effect sizes. Such work is extremely valuable and Dean himself gives several examples in the article of where he claims to have found artefacts. He did not identify these claimed artefacts by using meta-analysis, although he claims to have later confirmed one of them by meta-analysis (*ibid.*, p. 186).

³ Most of the same content of *AuS*, plus updates, is available in a more recent book, *Tests of Astrology* (Dean *et al.*, 2016).

⁴ According to a standard textbook on meta-analysis (Wolf, 1986, p. 14), building reliable and valid knowledge from meta-analysis requires precaution against the following errors: mixing dissimilar techniques, variable definitions, and subjects; mixing 'poorly' designed studies (those having sampling errors or artefacts) with 'good' studies; bias in favour of significant (or non-significant!) published findings; and using multiple results from the same study instead of independent results. Unfortunately, with no coordinated research programme, current astrological research is a wild mix of assorted techniques and data types, making it vulnerable to these problems even if the individual studies are presumed to be well designed.

2.4. Gauquelin's Neo-Astrology

Of the examples of artefacts that Dean claims to have found, one stands out. This is his claim regarding French psychologist Michel Gauquelin's famous findings that support astrology (Gauquelin, 1988a,b; Eysenck and Nias, 1982; Ertel and Irving, 1996; Ertel, 1988; Dean, 2002). If any study has 'revolutionized our understanding of astrology', it is not Dean's meta-analysis claims but the 'Gauquelin Revolution' of statistical discoveries, which Gauquelin called 'Neo-Astrology'.

In the 1950s through 1970s, Michel and Françoise Gauquelin discovered correlations with highly significant surpluses ($p < 0.001$, where significance is $p < 0.05$) of certain highly successful professionals (i.e. scientists, doctors, politicians, athletes, business executives, military leaders, and actors) who were born with specific planets in defined zones near the rising and culminating parts of the sky, now called 'Gauquelin sectors'. They also found highly significant deficits of specific planets in these same sectors that are correlated to other specific professions (i.e. musicians, writers, and artists).

The Gauquelin discoveries are especially relevant because the findings are consistent with the traditional properties of the correlated planets. One finding in particular, the correlation between Mars and famous athletes, which is the easiest to test, has been replicated with other sets of independent data gathered in France, Italy, Germany, United States, Belgium, and Holland. Even sceptical organizations, such as the Comité Para, centred in Belgium, have conducted their own replication tests and have agreed with Gauquelin's findings (Comité Para, 1976).

The Gauquelin discoveries are more significant than they are generally reported to be. A detailed assessment of the collected planetary data by German psychologist Suitbert Ertel, who was initially sceptical, demonstrated that the correlations increase in accord with professional eminence as objectively evaluated by public citations, except at the highest rank of exceptional genius. This 'eminence effect' was generally found across the tested professions (Ertel, 1988; 1989; 1993).

Based on these very striking findings, Ertel has defended Neo-Astrology against organized sceptics from all over the Western world, through dozens of peer-reviewed articles and through a book co-authored with Kenneth Irving, *The Tenacious Mars Effect* (Ertel and Irving, 1996). As a whole, these findings provide abundant evidence

that preclude altered consciousness, psi, or astrologers' hidden persuaders as the basis of the astrological experience, at least for the very large samples tested. In his and Kelly's article and in *AuS*, Dean completely ignores his long-running discourse with Ertel in professional journals regarding the Gauquelin findings.

Contrary to what other critics have alleged, both Ertel and Dean found that Gauquelin's large database of birth data is clean and free of sampling errors. To further ensure this, Ertel's methodology removes sampling bias by accepting any accurate birth data and subjecting it to objective ranking criteria based on citation frequencies in standard sources.⁵ As a last ditch effort against the mass of evidence that supports Gauquelin's findings, Dean suggests that the positive results are artefacts consistent with 'parents adjusting birth data to suit popular beliefs' (D&K, p. 186).

Dean alleges that it was commonplace for astrology-believing parents during the period of most of the births (1800–1959) to report false birth times to registry offices. He argues that parents could have calculated the birth times to prominently position the appropriate planets in Gauquelin sectors to be consistent with the desired profession. Presumably, the parents would then successfully raise their children in the desired professions to fulfil the prophecies of the falsely documented birth times. For example, a scientific or medical family would set aside their scepticism of astrology and misreport a birth time with Saturn in a Gauquelin sector because Saturn is traditionally associated with scientists, doctors, and sceptics. The argument seems a bit far-fetched to say the least.

In response to Dean's allegation of parental tampering, Ertel has repeatedly asked Dean to provide evidence, but Dean has evaded the burden of proof for his own argument (Ertel, 2000; 2002a,b; 2003; 2005; 2006; Dean, 2000; 2002; 2006). The exchange is still (as of summer 2016) not over as both parties continue to submit manuscripts to publications that seem to have become weary of the debate. The closest that Dean has come to answering Ertel is to argue guilt by association to a discreditable practice. Parents would sometimes misreport birth days to favour Christian feast days and lucky days of the

⁵ Ertel's objective ranking protocol is ignored by Benski *et al.* in the 1997 book *The 'Mars Effect': A French Test of over 1000 Sports Champions*. In a commentary section added at the end of the book, researcher J.W. Nienhuys dismisses this method by stating, 'Citations have only limited value... often books will mention a person for reasons other than his achievements' (*ibid.*, p. 143).

month and avoid days that were regarded as unlucky. Dean has presented data that suggests evidence of this practice, although Ertel has challenged it. Dean argues that if the parents misreported birth *dates* for social reasons, then they would likely have also misreported specific birth *times* for astrological reasons (Dean *et al.*, 2016).

Dean suggests that the false birth times could have been calculated from certain almanacs that contained planetary ephemerides, ignoring that this would have been a considerable feat of mathematics for most people at the time. Dean's argument implies that knowledge of Gauquelin sectors, or something like them (the historical astrological texts are somewhat unclear), existed before they were discovered. It suggests that Gauquelin merely rediscovered a practice of time falsification that is completely absent in the historical record. Because of its unfalsifiability, there is no way to challenge Dean's parental tampering claim with evidence.

2.5. *Time Twins*

Of all the claims presented in Dean and Kelly's (2003) article, the two that are most frequently cited are Dean's meta-analysis study and his self-proclaimed 'definitive' study of astrological time twins. The concept of time twins goes back a long way. Critics as early as Cicero (c. 50 BCE) have argued that any deterministic interpretation of astrology implies that everyone born on the same day, at approximately the same place and moment, would necessarily live identical lives and share an identical fate. Yet even biologically identical twins do not conform to this prediction.

As Dean describes in the article, astrologers have tried to develop methods to statistically evaluate time twin characteristics (Roberts and Greengrass, 1994). One challenge is that it is not easy to find enough close time twins to make accurate inferences. Another challenge is that astrological theory is not very deterministic. Even if natal charts are each considered as a whole, as they generally are in time twin studies, there is no theory on how much twinning of personality or lifestyle to expect. Astrological textbooks offer options of related interpretations for each natal chart feature and this reflects the adaptive choices that a native can make throughout life. Just as in genetics where it is understood that different environments and epigenetic configurations can contribute to differences in genetically identical twins (Brogaard and Marlow, 2012; McKie, 2013), it can be

similarly argued that different adaptive choices within identical astrological environments can contribute to differences in time twins.

In Dean's forthcoming study of time twins, which he very briefly describes in the article, Dean takes an extraordinary approach. Instead of a cross-sectional study as one might expect, in which different individuals with the same characteristics (i.e. birth time and location) are compared as a large group, Dean uses the data of a longitudinal study, in which a group of the same individuals is observed over a long period of time.

The time twins data, as Dean has only recently confirmed in *AuS*, come from Britain's National Child Development Study (NCDS), unconnected with astrology, of the lives of 2,101 participants born in London during 3–9 March 1958. The participants were born an average of only 4.8 sequential minutes apart. The participants were measured at ages 11, 16, and 23 on 110 variables. These included IQ test scores; ratings of behaviour such as anxiety, aggressiveness, and sociability; physical data such as height, weight, vision, and hearing; self-ratings on art, music, and sports; and other factors such as occupation, accident proneness, and marital status. Dean says that these are all areas of astrological interest (D&K, p. 188).

Dean claims that testing time twins is a definitive, powerful test of astrology because the natal charts do not need to be interpreted. 'Errors and uncertainties of birth chart interpretation are avoided' (*ibid.*, p. 188). However, this still leaves uncertainties in other judgments and begs the question of how the hits or close resemblances in twin states are defined. What if one time twin is 182 cm tall and the other is 180 cm? If one is an oboe player in an orchestra and the other is an avid karaoke singer, do they closely resemble each other? Dean hints that he rates the convergences of twin states according to time separations but he does not give the necessary details about how he defines the evaluations. Without providing these crucial details, Dean's test is not at all definitive.

Based on what little Dean does say in the article and in *AuS*, his method of testing time twins uses a questionable design. The method was to divide the longitudinal sample by using cross-sections of only two subjects, AB, BC, CD, and so on. This gave Dean 2,100 serial pairs of very close time twins. Dean claims this method 'minimizes the risk of artifacts' (*ibid.*, p. 189). But cross-sections of two could also minimize the possibility of finding any astrological evidence. Dean could have designed the test with various larger cross-sections without an increased risk of artefacts.

A number of observers, including myself, have asked Dean to provide samples of the experimental data for peer review and replication. Dean has largely evaded these requests and has only recently mentioned by way of explanation in *AuS* that '[a]ccess to NCDS data requires official permission and signing an agreement that forbids passing data to other parties' (Heukelom, Dean, and Terpstra, 2013, p. 237). Dean has not yet published the study, which since 2003 is still 'forthcoming'. Dean's lengthy procrastination and his unwillingness to share the methodology or the evidence in any format could be seen to amount to a publication bias that erodes his time twins claims.

2.6. *EPI Predictions*

Based on his claims of meta-analysis, parental tampering, and time twins, all of which in my view contain serious problems, Dean concludes that there is no purely empirical evidence that supports an astrological worldview. Consequently, he turns his attention to human factors that presumably, although he does not say so, would cover astrologers' psi, if it exists. If astrologers fail to perform tasks in tests that remove hidden persuaders, then it might be inferred that hidden persuaders are the real cause of the astrological experience and not psi.

Dean claims to have conducted the 'most systematic investigation of astrologer variables including the reported use of intuition'. In the main part of his ambitious three-part study (Dean, 1985), Dean asked astrologers ($N = 45$) to report how much they relied on intuition in the performance of their tasks (i.e. none, hardly any, some, or lots). In Dean's evaluation, the astrologers performed poorly in their tasks and the contribution of intuition (and presumably psi) towards the success of the tasks is 'negligible' (D&K, p. 191).

For the assessment, Dean used the Eysenck Personality Inventory (EPI), where the E dimension is extraversion (sociability) and N is neuroticism (emotional stability). These are graphically measured such that E+ is sociable and outgoing, E- is quiet and reserved, N+ is emotional and easily upset, and N- is calm and not easily upset. The astrologers' task was to predict the direction (+ or -) of E and N in the most extreme subjects ($N = 160$) selected from a larger sample ($N = 1198$). This selection represented only the top and bottom one-fifteenth of the entire sample, which Dean says 'well exceeds' the normal approach in psychology of using the top and bottom one-third.

Of the 160 subjects selected for the test, 40 were extreme E only, 40 were extreme N only, and 80 were extreme in both E and N.

Dean claims that, as in his test of time twins, his selection of the E and N test subjects ‘could hardly have been more conducive to success’ (*ibid.*, p. 191). A complication that Dean does not appear to notice is that modern astrological practice generally makes distinctions between what the EPI calls *personality dimensions* and another evaluation that could be called *psychological states*. It can be argued that the N+ (emotional and easily upset) measurement should properly be regarded as a psychological state because it signals an uncomfortable, stressful psychological disturbance. Its effect is quite unlike the N-, E+, and E- dimensions that are not associated with stress and are therefore relatively stable. Calling N+ a ‘dimension’ suggests it is a permanent feature of personality with stresses that cannot be adapted or resolved. As an objection, the N+ ‘personality dimension’ of the EPI can come across as judgmental and potentially stigmatizing.

Astrology does not evaluate personality traits in the same rigid way. All standard astrological textbooks describe both the ‘afflicted’ states and the ‘growth’ or creative states of each astrological configuration as potentials but do not specify which states are currently in effect because that is presumed to be mainly under the control of the native. The native, as an astrological client, needs to be made aware of the details of both the afflicted states and the growth states and to make their own choices based on the potentials for stress. As Rosenblum aptly describes, ‘A particularly good use of astrology is its capacity to point out difficult aspects of an individual’s personality and at the same time show the beneficial and constructive possibilities of these very traits’ (Rosenblum, 1983, p. 13).

In regard to Dean’s published data, the astrologers scored consistently better at discerning the two E scores than the two astrologically ambiguous N scores, one of which astrologically represents a disturbed or afflicted state (D&K, p. 192). Because the EPI does not discriminate personality dimensions from psychological states in the same way that astrology does, the comparison appears to be categorically flawed and Dean’s results, through no fault of his own, must be considered as inconclusive.⁶

⁶ Additional criticism of Dean’s EPI prediction test is presented in a forthcoming paper by Robert Currey. In astrology, the scale from E+ to E- is contextual and the EPI does

2.7. Chart Matching Tests

Dean concludes his investigation of human factors by describing two studies by other researchers. He calls this section ‘When astrologers receive everything they ask for’. A more accurate heading would be ‘When astrologers do everything they are told’. In the two nearly identical studies, the astrologers naïvely and uncritically followed the researchers’ instructions and suggestions.

One of the studies was by American psychology professors John McGrew and Richard McFall (1990). The other was by Dutch researcher Rob Nanninga (1996). The researchers in both studies told the participating astrologers to compile a list of open-ended questions to elicit self-descriptive narratives from the test subjects. The researchers selected questions from the astrologers’ lists and administered their questionnaires. The researchers then asked the astrologers to match the resulting narratives to the subjects’ natal charts. Both studies contain serious problems that may not be obvious to most readers.

To begin with, the researchers used an astrologer-created questionnaire instead of reliable, standardized psychological questionnaires such as the CPI or the NEO-FFI, which had been used in previous astrological studies of this type. This substitution presumes that clients can accurately describe their own personalities and lifestyles, which astrological practice never assumes and neither does psychological testing. The researchers did not tell the astrologers of the limitations inherent in open-ended, *ad hoc* questionnaires compared to regression tested psychological questionnaires. Nor did the researchers explain the well-known tendency for people to have overly positive illusions about themselves (Taylor and Brown, 1988; 1994) and the vulnerability of the *ad hoc* questionnaires to these illusions.

The experimental designs in both studies contain an identical twist. McGrew and McFall claim their test design ‘overcomes the methodological and “astrological” limitations of previous studies’ (McGrew and McFall, 1990, p. 77). The big problem is that the test design

not account for this. For example, for a particular individual, E+ may pertain to work life and E- may pertain to social situations, as assessed by astrological theory. Dean ignores that a person can simultaneously be both E+ and E-. Eysenck’s division of traits (Eysenck and Nias, 1982) stems from classical Earth, Air, Fire, and Water characteristics yet they do not unambiguously fit astrological theory. Dean, in common with other astrologers, associates Air to E+ (sociable, etc.) but Eysenck associates E- to traits that in astrology also associate to Air (thoughtful, even-tempered, and peaceful).

introduced major inconsistencies with normal astrological practice. The astrologers were not asked to provide descriptive chart interpretations. Instead, the astrologers were asked to assess and match natal charts to the subjects' life narratives. Conversely, the test subjects were not asked to assess any descriptions of themselves as they could be expected to do following a chart reading, but instead they wrote their own personality assessments. In effect, the critical assessment skills were tested and evaluated on the wrong parties where the skills would not be presumed by either astrology or psychology.

There is more. Both of the studies implemented a Poisson distribution that is highly sensitive to errors. The researchers did not tell the astrologers about this feature either. The Poisson distribution creates a cognitive illusion similar to the well-known 'birthday paradox'. It seems highly unlikely and 'paradoxical' that in any group of only 23 people there is at least a 50% chance that two of the people share the same birthday. In reverse, where it is known that matches exist, this effect produces an illusion of likelihood and over-confidence.

In the McGrew and McFall experiment, the astrologers might have thought they had at least a 50% chance of matching the 23(!) charts that the researchers gave them. Dean says, 'Half expected 100% hits' (D&K, p. 194). But the mathematical probability was less than one in 10^{30} . Similarly, in the Nanninga experiment, in which astrologers were asked to match seven charts, the probability was less than one in 10^9 .

In both the McGrew and McFall study and the Nanninga study, the researchers implemented known artefacts and inferential biases that adversely influenced the test methodology and rendered their experiments unreliable. The fact that the astrologers did not stop the researchers from doing this does not justify the results.

2.8. *Serious Omissions*

Although Dean fails to mention it, the McGrew and McFall study and the Nanninga study were replications of American physicist Shawn Carlson's famous double-blind test of astrology, published in *Nature* (1985). In that study, Carlson had used both the standardized California Psychological Inventory (CPI) questionnaire and complete interpretations of student test subjects' natal charts written by reputable astrologers who participated.

Briefly described, Carlson used rigorous research protocols to remove potential errors and artefacts, such as giveaway sign clues, including artefacts that McGrew and McFall later introduced and

Nanninga replicated. The study tested volunteer test subjects with the CPI and the written astrological profiles. The test subjects were asked to rate (on a scale of 1 to 10) each section separately and to rank (as first, second, or third choice) the overall fitness of three natal chart descriptions, one of which was genuine, to themselves. Similarly, they also rated and ranked sets of CPI results to themselves. The astrologers were given sets of three CPIs (one of which was genuine) and were asked to rate (1 to 10) each CPI section and to rank (as first, second, and third choice) the overall fitness compared to each natal chart.

Although Carlson claimed ‘a surprisingly strong case against natal astrology’, an assessment by Ertel (2009), published after Dean and Kelly’s article, found that Carlson had not followed the hypothesis in one test and had split into three what was properly a single sample in another test. The published data, as assessed by Ertel, shows that, despite sampling errors and other problems that worked against the astrologers, the astrologers had successfully matched the CPI profiles to natal charts in both of their tests at probabilities that were statistically significant ($p < 0.054$ marginal, and $p < 0.037$, where significance is $p < 0.05$) (Ertel, 2009).

The later of these two results is equivalent to tossing a coin 12 times and getting heads more than 10 times. British astrologer Robert Currey attributes the more successful result to the more precise format that allowed discrimination among 1000 options instead of only three. This enabled the astrologers to give poor matches lower ratings and the format is recommended for future tests (Currey, 2011, pp. 20–1).

In contrast to the astrologers’ performance, the results of the tasks performed by Carlson’s student test subjects (split into a test group and a control group) were inconclusive and had an unexplained anomaly. The test group identified neither their own astrological interpretations nor their own CPI profiles. Surprisingly, the control group successfully ranked the pre-selected ‘correct’ astrological description at a highly significant probability ($p < 0.01$) although none of the descriptions were genuine. Carlson attributed the anomaly to statistical fluctuation. Unfortunately, he discarded the data from the more detailed (1–10 rating scale) variation of this test because of an unexpected consistency in the results. Apparently, Carlson did not recognize how the unreported data could nevertheless be evidence to clarify the anomaly (McRitchie, 2011, p. 35).

On the strength of its sample size ($N = 100+$) and astrological participants ($N = 26$), the absence of hidden persuaders, its publication

in *Nature*, and the absence of any serious challenges, Carlson's study as assessed by Ertel stands as an example of experimental support for the performance of astrologers. Besides this human study and besides the more empirical Gauquelin studies already mentioned, there are some exemplary astrological studies that do not require any interpretations by astrologers nor any practical concerns of consciousness and psi. These examples are studies of naturally red hair (Hill and Thompson, 1988), workplace accidents (Ridgley, 1993), and earthquakes (Hill and Polit, 1986). Each of these peer-reviewed studies has highly significant results, was available prior to Dean and Kelly's article, and is consistent with astrological theory.⁷

⁷ In a replicated study by American researchers Judith Hill and Jacalyn Thompson (1988), natal charts of people with naturally red hair ($n = 500$) were assessed against control groups. Evidence supported ($p < 0.001$) the sealed *a priori* hypothesis, consistent with astrological theory, that red hair is correlated with Mars within 30 degrees of the natal chart ascendant and not within 30 degrees of the natal chart descendant and the effect increases with the redness of the hair. Replications of the study ($n = 497$, $n = 373$, $n = 100$) that used varying criteria for red hair found significant results, some of which were extremely high. Because red hair is a genetic factor that can be objectively evaluated (Hill, 1996), this research holds promise of further empirical refinements (*ibid.*). Also, because the births in the study were relatively recent, it also suggests that Michel Gauquelin's conclusion that astrological effects apply only to natural births (and hence are less reliable after about 1950) should be reconsidered pending further study.

American psychologist Sara Klein Ridgley (1993) in her PhD research paper found astrological indicators of a sample of people ($n = 1023$) who were disabled by workplace accidents for at least three months and filed Workers' Compensation claims. Ridgley found that workplace accidents occur far more frequently ($p < 0.00000001$) when transiting Sun is in a 'hard' aspect (0, 90, 180, or 270 degrees) to the natal Sun. This finding is consistent with astrological theory. Remarkably, this injury event pattern is absent in similar data gathered in Sweden where birthdays are work holidays (Ridgley, c. 2000). This observation suggests that the injury potential can be collapsed by preventive behaviours and it holds promise for further investigation that could potentially save lives, injury, and expense. Unfortunately, US data is no longer obtainable for further replications due to new privacy laws.

Research by Judith Hill and Mark Polit (1986), in a rare example of a funded astrological research programme, found evidence of astrological effects within geographic earthquake regions. The programme consisted of three separate studies totalling 221 groups of regional earthquakes throughout the world. Strong seismic activity within the regions correlated ($p < 0.001$) with planetary positions that are unique to each region compared to over 2,000 random dates supplied by an independent seismologist. Consistent with astrological theory, the planetary positions on earthquake dates tend to occur at positions that are 0, 90, 180, or 270 degrees (within 15 degree tolerance or 'orb') to their own positions on the dates of previous earthquakes in the same region. These results suggest that predictive algorithms can be created for each earthquake region based on its astrological and seismic history. Hill and Polit also found that strong planetary correlations might occur within a region for a number of years and then

3. Discussion

Astrology needs better critical thinking and better testing than Dean and Kelly provide. Dean and Kelly ignore the astrological corpus and instead create a straw man caricature of distorted astrological claims and distorted testing methodologies that they can easily attack. In their conclusion they state, ‘...if astrologers could perform better than chance, this might support their claim (*sic*) that reading specifics from birth charts depends on psychic ability and a transcendent reality related to consciousness’ (D&K, p. 195). The alleged claim of psychic ability is demonstrably false among reputable astrologers. Even Geoffrey Cornelius (1994/2003), in his description of divination, does not claim any need for psychic ability. Charles Carter (1925) openly disclaims psychism in favour of the astrological corpus that is based on observation, principles, and theory.

The many flaws in the arguments and experiments that the authors use, which are presumably the very best they can find, suggests rather strongly that there is no reliable evidence against astrological theory and practice. On the other hand, apart from their failure to mention them, Dean and Kelly do nothing to diminish the most robust of the existing research studies that have demonstrated support of astrology.

Looking on the positive side, the many problems in Dean and Kelly’s article can contribute insights into further astrological research. Time twin studies continue to hold promise. All of the time twin participants in Dean’s study were born within one week — this is a short period that qualifies all of them as time twins. Astrologers would like to evaluate the data for patterns in cross-sections that are based on astrological themes. What if the participants were grouped by rising sign or rising degree? What if they were grouped by planets on the horizon or meridian, or in Gauquelin sectors? What if they were grouped by astrological aspects? Would the traditional astrological patterns emerge and would they correlate to twin convergence? If made available to astrologers, Dean’s time twin data could potentially be a valuable resource for research.⁸

abruptly cease or change. Continued studies of astrology and earthquakes could lead to measures that would potentially avoid widespread devastation.

- ⁸ As an additional thought on Dean’s time twins, could the surviving test subjects find and document interesting twin-like similarities among themselves that could be astrologically and statistically analysed? This would allow more peculiar results to be captured from the large sample. On an even more ambitious scale, could social media be applied to the task? Would large numbers of people be willing to connect to others and

With regard to Dean's test using the EPI, or similar tests using the NEO-FFI, there now exist newer tests that appear to be better suited for comparison with astrology. These new tests do not diagnose mental or emotional disturbances, nor do they seek to identify gender-specific traits that earlier the psychology tests had been concerned with. Instead, they test for perceptions of human potential and for social adaptation. For example, tests for multiple intelligences, emotional intelligence, and demographic or psychographic values, as well as the ordinary standard vocational aptitude tests, could hold greater promise in joint research programmes with the astrological community (McRitchie, 2004; 2006).

As a final observation, a remark by Dean gives a revealing insight into how he and many others may think about astrology. By ignoring the astrological corpus, Dean attributes the astrological experience to hidden persuaders, 'whose hidden nature might explain the apparent absence of any reason why astrology should work' (D&K, p. 185). The circular logic of this goes as follows: 1. Astrology can be explained by hidden persuaders. 2. Because the persuaders are hidden they appear to be absent. 3. If reasons for astrology appear to be absent, then astrology must be explained by hidden persuaders. The result of this closed-mindedness contributes to evasion of potentially useful evidence, contempt for the astrological corpus, and disdain for peer review with astrological subject matter experts. 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.

Acknowledgments

I wish to thank Professor Emeritus Suitbert Ertel and Robert Currey for their help and advice.

explore time twin convergences compared with psychological test scores or with personal habits culled from digital data? Such a 'time twins collider' app would enable participants to interact with their time twins locally and globally. Besides being a potential social phenomenon, such an app could generate unprecedented data that could potentially be analysed to understand new patterns of personality, relating, and lifestyle.

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Paper received August 2015; revised January 2016.