

On astrology

Richard Dawkins

On 27 December, 1997, one of Britain's largest circulation national newspapers, the *Daily Mail*, devoted its main front-page story to astrology under the banner headline "1998: The Dawn of Aquarius". One feels almost grateful when the article goes on to concede that the Hale Bopp comet was not the *direct* cause of Princess Diana's death. The paper's highly paid astrologer tells us that 'slow-moving, powerful Neptune' is about to join 'forces' with the equally powerful Uranus as it moves into Aquarius. This will have dramatic consequences:

. . . the Sun is rising. And the comet has come to remind us that this Sun is not a physical sun but a spiritual, psychic, inner sun. It does not, therefore, have to obey the law of gravity. It can come over the horizon more swiftly if enough people rise to greet and encourage it. And it can dispel the darkness the moment it appears.

Richard Dawkins' latest book *Unweaving the Rainbow* (Penguin Books, 1998) is reviewed elsewhere in this issue. It contains, among much else of value, his considered views on the subject of astrology. We are grateful to Professor Dawkins and his publishers for his permission to publish this extract from the book here.

How can people find this meaningless pap appealing, especially in the face of the real universe as revealed by astronomy? On a moonless night when 'the stars look very cold about the sky', and the only clouds to be seen are the glowing smudges of the Milky Way, go out to a place far from street light pollution, lie on the grass and gaze up at the sky. Superficially you notice constellations, but a constellation's pattern means no more than a patch of damp on the bathroom ceiling. Note, accordingly, how little it means to say something like 'Neptune moves into Aquarius'. Aquarius is a miscellaneous set of stars all at different distances from us which are unconnected with each other except that they constitute a (meaningless) pattern when seen from a certain (not particularly special) place in the galaxy (here). A constellation is not an entity at all, and so not the kind of thing that Neptune, or anything else, can sensibly be said to 'move into'. The shape of a constellation, moreover, is ephemeral. A million years ago our *Homo erectus* ancestors gazed out nightly (no light pollution then, unless it came from that species' brilliant innovation, the camp fire) at a set of very different constellations. A million years hence, our descendants will see yet other shapes in the sky and we already know exactly how these will look. This is the sort of detailed prediction that astronomers, but not astrologers, can make. And - again by contrast with astrological predictions - it will be correct. Because of light's finite speed, when you look at the great galaxy in Andromeda you are seeing it as it was 2.3 million years ago and *Australopithecus* stalked the high veldt. You are looking back in time. Shift your eyes a few degrees to the nearest bright star in the constellation of Andromeda and you see Mirach, but much more recently, as it was when Wall Street crashed. The sun, when you witness its colour and shape, is only eight minutes ago. But

point a large telescope at the Sombrero galaxy and you behold a trillion suns as they were when your tailed ancestors peered shyly through the canopy and India collided with Asia to raise the Himalayas. A collision on a larger scale, between two galaxies in Stephan's Quintet, is shown to us at a time when on earth dinosaurs were dawning and the trilobites fresh dead.

Name any event in history and you will find a star out there whose light gives you a glimpse of something happening during the year of that event. Provided you are not a very young child, somewhere up in the night

sky you can find your personal birth star. Its light is a thermonuclear glow that heralds the year of your birth. Indeed, you can find quite a few such stars (about 40 if you are 40; about 70 if you are 50; about 175 if you are 80 years old). When you look at one of your birth year stars, your telescope is a time machine letting you witness thermonuclear events that are actually taking place during the year you were born. A pleasing conceit, but that is all. Your birth star will not deign to tell anything about your personality, your future or your sexual compatibilities. The stars have larger agendas in which the preoccupations of human pettiness do not figure. Your birth star, of course, is yours for only this year. Next year you must look to the surface of a larger sphere one light year more distant. Think of this expanding sphere as a radius of good news, the news of your birth broadcast steadily outwards. In the Einsteinian universe in which most physicists now think we live, nothing can in principle travel faster than light. So, if you are 50 years old, you have a personal news bubble of 50 light years' radius. Within that sphere (of a little more than a thousand stars) it is in principle possible (although obviously not in practice) for news of your existence to have permeated. Outside that sphere you might as well not exist; in an Einsteinian sense you do not exist. Older people have larger existence spheres than younger people, but nobody's existence extends to more than a tiny fraction of the universe. The birth of Jesus may seem an ancient and momentous event to us as we reach his second millenary. But the news is so recent on this scale that, even in the most ideal circumstances, it could in principle have been proclaimed to less than one 200 million millionth of the stars in the universe. Many, if not most, of the stars out there will be orbited by planets. The numbers are so vast that probably some of them have life forms, some have evolved intelligence and technology. Yet the distances and times that separate us are so great that thousands of life forms could independently evolve and go extinct without it being possible for any to know of the existence of any other.

In order to make my calculations about numbers of birth stars, I assumed that the stars are spaced, on average, about 7.6 light years apart. This is approximately true of our local region of the Milky Way galaxy. It seems an astonishingly low density (about 440 cubic light years per star), but it is actually high by comparison with the density of stars in the universe as a whole, where space lies empty between the galaxies. Isaac Asimov has a dramatic illustration: it is as if all the matter of the universe were a single grain of sand, set in the middle of an empty room 20 miles long, 20 miles wide and 20 miles high. Yet, at the same time, it is as if that single grain of sand were pulverized into a thousand million million fragments, for that is approximately the number of stars in the universe. These are some of the sobering facts of astronomy, and you can see that they are beautiful.

Astrology, by comparison, is an aesthetic affront. Its pre-Copernican dabblings demean and cheapen astronomy, like using Beethoven for commercial jingles. It is also an insult to the science of psychology and the richness of human personality. I am talking about the facile and potentially damaging way in which astrologers divide humans into 12 categories. Scorpios are cheerful, outgoing types, while Leos, with their methodical personalities, go well with Libras (or whatever it is). My wife Lalla Ward recalls an occasion when an American starlet approached the director of the film they were both working on with a "Gee, Mr Preminger, what sign are you?" and received the immortal rebuff, in a thick Austrian accent, "I am a Do Not Disturb sign."

Personality is a real phenomenon and psychologists have had some success in developing mathematical models to handle its variation in many dimensions. The initially large number of dimensions can be mathematically collapsed into fewer dimensions with measurable, and for some purposes conscionable, loss in predictive power. These fewer derived dimensions sometimes correspond to the dimensions that we intuitively think we recognize - aggressiveness, obstinacy, affectionateness and so on. Summarizing an individual's personality as a point in multidimensional space is a serviceable approximation whose limitations can be stated. It is a far cry from any mutually exclusive categorization, and certainly far from the preposterous fiction of newspaper astrology's 12 dumpbins. It is based upon genuinely relevant data about people themselves, not their birthdays. The psychologist's multidimensional scaling can be useful in deciding whether a person is suited to a particular career, or a proposed couple to each other. The astrologer's 12 pigeonholes are, if nothing worse, a costly and irrelevant distraction.

Moreover, they sit oddly with our current strong taboos, and laws, against discrimination. Newspaper readers are schooled to regard themselves and their friends and colleagues as Scorpios or Libras or one of the other 10 mythic 'signs'. If you think about it for a moment, isn't this a form of discriminatory labelling rather like the cultural stereotypes which many of us nowadays find objectionable? I can imagine a Monty Python sketch in which a newspaper publishes a daily column something like this:

Germans: It is in your nature to be hard-working and methodical, which should serve you well at work today. In your personal relationships, especially this evening, you will need to curb your natural tendency to obey orders.

Spaniards: Your Latin hot blood may get the better of you, so beware of doing something you might regret. And lay off the garlic at lunch if you have romantic aspirations in the evening.

Chinese: Inscrutability has many advantages, but it may be your undoing today . . .

British: Your stiff upper lip may serve you well in business dealings, but try to relax and let yourself go in your social life.

And so on through 12 national stereotypes. No doubt the astrology columns are less offensive than this, but we should ask ourselves exactly where the difference lies. Both are guilty of facile discrimination, dividing humanity up into exclusive groups based upon no evidence. Even if there were evidence of some slight statistical effects, both kinds of discrimination encourage prejudiced handling of people as types rather than as individuals. You can already see advertisements in lonely hearts columns that include phrases like 'No Scorpios' or 'Tauruses need not apply'. Of course this is not as bad as the infamous 'No blacks' or 'No Irish' notices, because astrological prejudice doesn't consistently pick on some star signs more than others, but the principle of discriminatory stereotyping - as opposed to accepting people as individuals - remains.

There could even be sad human consequences. The whole point of advertising in lonely hearts columns is to increase the catchment area for meeting sexual partners (and indeed the circle provided by the workplace and by friends of friends is often meagre and needs enriching). Lonely people, whose life might be transformed by a longed-for compatible friendship, are encouraged to throw away wantonly and pointlessly up to eleven twelfths of the available population. There are some vulnerable people out there and they should be pitied, not deliberately misled.

On an apocryphal occasion a few years ago, a newspaper hack who had drawn the short straw and been told to make up the day's astrological advice relieved his boredom by writing under one star sign the following portentous lines: 'All the sorrows of yesteryear are as nothing compared to what will befall you today.' He was fired after the switchboard was jammed with panic-stricken readers, pathetic testimony to the simple trust people can place in astrology.

In addition to anti-discrimination legislation, we have laws designed to protect us from manufacturers making false claims for their products. The law is not invoked in defence of simple truth about the natural world. If it were, astrologers would provide as good a test case as could be desired. They make claims to forecast the future and divine personal foibles, and they take payment for this, as well as for professional advice to individuals on important decisions. A pharmaceuticals manufacturer who marketed a birth control pill that had not the slightest demonstrable effect upon fertility would be prosecuted under the Trade Descriptions Act, and sued by customers who found themselves pregnant. Once again it feels like overreaction, but I cannot actually work out why professional astrologers are not arrested for fraud as well as for incitement to discrimination.

The London *Daily Telegraph* of 18 November, 1997 reported that a self-styled exorcist who had persuaded a gullible teenage girl to have sex with him on the pretext of driving evil spirits from her body had been jailed for 18 months the day before. The man had shown the young woman some books on palmistry and magic, then told her that she was 'jinxed: someone had put

bad luck on her'. In order to exorcise her, he explained, he needed to anoint her all over with special oils. She agreed to take all her clothes off for this purpose. Finally, she copulated with the man when he told her that this was necessary 'to get rid of the spirits'. Now, it seems to me that society cannot have it both ways. If it was right to jail this man for exploiting a gullible young woman (she was above the legal age of consent), why do we not similarly prosecute astrologers who take money off equally gullible people; or 'psychic' diviners who con oil companies into parting with shareholders' money for expensive 'consultations' on where to drill? Conversely, if it be protested that fools should be free to hand over their money to charlatans if they choose, why shouldn't the sexual 'exorcist' claim a similar defence, invoking the young woman's freedom to give her body for the sake of a ritual ceremony in which, at the time, she genuinely believed?

There is no known physical mechanism whereby the position of distant heavenly bodies at the moment of your birth could exert any causal influence on your nature or your destiny. This does not rule out the possibility of some unknown physical influence. But we need bother to think about such a physical influence only if somebody can produce any evidence that the movements of planets against the backdrop of constellations actually has the slightest influence on human affairs. No such evidence has ever stood up to proper investigation. The vast majority of scientific studies of astrology have yielded no positive results whatever. A (very) few studies have suggested (weakly) a statistical correlation between star 'sign' and character. These few positive results turned out to have an interesting explanation. Many people are so well versed in star sign lore that they know which characteristics are expected of them. They then have a small tendency to live up to these expectations - not much, but enough to produce the very slight statistical effects observed.

A minimal test that any reputable method of diagnosis or divining ought to pass is that of reliability. This is not a test of whether it actually works, merely a test of whether different practitioners confronted with the same evidence (or the same practitioner confronted with the same evidence twice) agree. Although I don't think astrology works, I really would have expected high reliability scores in this sense of self-consistency. Different astrologers, after all, presumably have access to the same books. Even if their verdicts are wrong, you'd think their methods would be systematic enough at least to agree in producing the same wrong verdicts! Alas, as shown in a study by G. Dean and colleagues, they don't even achieve this minimal and easy benchmark. For comparison, when different assessors judged people on their performance in structured interviews, the correlation coefficient was greater than 0.8 (a correlation coefficient of 1.0 would represent perfect agreement, -1.0 would represent perfect disagreement, 0.0 would represent complete randomness or lack of association; 0.8 is pretty good). Against this, in the same study, the reliability coefficient for astrology was a pitiable 0.1, comparable to the figure for palmistry (0.11), and indicating near total randomness. However wrong astrologers may be, you'd think that they would have got their act together to the extent of at least being consistent. Apparently not. Graphology (handwriting analysis) and Rorschach (inkblot) analyses aren't much better.

The job of astrologer requires so little training or skill that it is often handed out to any junior reporter with time on his hands. The journalist Jan Moir relates in the *Guardian* on 6 October, 1994 that, 'My very first job in journalism was writing horoscopes for a stable of women's magazines. It was the office task always given to the newest recruit because it was so stupid and so easy that even a wet-eared geek like me could do it.' Similarly, when he was a young man the conjuror and rationalist James Randi took a job, under the pseudonym Zo-ran, as astrologer on a Montreal news paper. Randi's method of working was to take old astrology magazines, cut out their forecasts with scissors, stir them around in a hat, paste them at random under the 12 'signs', then publish them as his own 'forecasts'. He describes how he overheard a pair of office workers in their lunch break in a cafe eagerly scanning 'Zo-ran's' column in the paper.

They squealed with delight on seeing their future so well laid out, and in response to my query said that Zo-ran had been 'right smack on' last week. I did not identify myself as Zo-ran . . . Reaction in the mail to the column had been quite interesting, too, and sufficient for me to decide that many people will accept and rationalize almost any pronouncement made by someone they believe to be an authority with mystic powers. At this point, Zo-ran hung up his scissors, put away the paste pot, and went out of business. *Flim-Flam* (1992)

There is evidence from questionnaire research that many people who read daily horoscopes don't really believe them. They state that they read them only as 'entertainment' (their taste in what constitutes entertaining fiction is evidently different from mine). But significant numbers of people really do believe and act upon them including, according to alarming and apparently authentic reports, Ronald Reagan during his time as president. Why is anybody impressed by horoscopes?

First, the forecasts, or character-readings, are so bland, vague and general that they fit almost anybody and any circumstance. People normally read only their own horoscope in the newspaper. If they forced themselves to read the other 11 they'd be far less impressed with the accuracy of their own. Second, people remember the hits and overlook the misses. If there is one sentence in a paragraph-long horoscope which seems to strike home, you notice that particular sentence while your eye skims unseeingly over all the other sentences. Even if people do notice a strikingly wrong forecast, it is quite likely to be chalked up as an interesting exception or anomaly rather than as an indication that the whole thing might be baloney. Thus David Bellamy, a popular television scientist (and genuine conservationist hero), confided in *Radio Times* (that once-respected organ of the BBC) that he has the 'Capricorn caution' over certain things, but mostly he puts his head down and charges like a real goat. Isn't that interesting? Well, I do declare, it just bears out what I always say: it's the exception that proves the rule! Bellamy himself presumably knew better, and was just going along with the common tendency among educated people to indulge astrology as a bit of harmless entertainment. I doubt if it is harmless, and I wonder whether people who describe it as entertaining have ever actually been entertained by it.

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