

Chapter 10: Hypernotes

WWW 10:1

A few lines after describing reading Carlyle's *Chartism*, (LeQuesne, 1982 p.57), Emma Darwin mentions that "The baby [William, met already in chapter 7] performed his first smile today, a great event...". Carlyle's essay on 'Chartism' is still in print (Shelston, 1971).

There was clearly some ambivalence in Charles Darwin's own views on Carlyle, since in February 1838 in a letter to Emma he had said that "I feel particularly well towards him", and in January 1839 that "Carlyle is the best worth listening to of any man I know". Forty years later he took the opportunity to abuse Carlyle in his *Autobiography* (Darwin & Huxley, 1974 pp 66-7):

"Carlyle sneered at almost everyone: one day in my house, he called Grote's *History* 'a fetid quagmire, with nothing spiritual about it'. I always thought until his *Reminiscences* appeared, that his sneers were partly jokes, but this now seems rather doubtful. His expression was that of a depressed, almost despondent, yet benevolent man; and it is notorious how heartily he laughed. ... His mind seemed to me a very narrow one; even if all branches of science, which he despised, are excluded. ... As far as I could judge, I never met a man with a mind so ill adapted for scientific research."

Even Carlyle's biographer, Froude, said that the 'Occasional discourse on the Nigger Question' of 1849 gave 'universal offence'. Darwin in his *Autobiography* put it simply: "his views about slavery were revolting".

The success or otherwise of the Carlyle's marriage has always been controversial, although even contemporaries were aware of its weaknesses, Samuel Butler for instance having remarked that it was "very good of God to let Carlyle and Mrs Carlyle marry one another, and so make only two people miserable instead of four" (Ashton, 2002).

As an old man Carlyle was undoubtedly not particularly likeable. As a young man, T H Huxley had read and admired Carlyle deeply, and his style probably influenced Huxley's. The curmudgeonly old Carlyle, a man "nearly always desperately unhappy ... permanently soured by ill-luck", as the then Eric Blair described him (Orwell, 1970 p.57), is well shown in an incident when,

"...near the end of Carlyle's life, [T H] Huxley saw him walking slowly and alone down the opposite side of the street, and touched by his solitary appearance, crossed over and spoke to him. The old man looked, and merely remarking, 'You're Huxley, aren't you? The man that says we are all descended from monkeys', went on his way" (Michell, 1913).

In 1867, Carlyle's photograph had been taken by the pioneer photographer, Julia Margaret Cameron, and he was already looking the gaunt, unwell man who could not allow himself to respond to Huxley's hand of friendship.



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Although Carlyle's *Reminiscences* seemed to be published with unseemly haste, just weeks after his death, the author had agreed with Froude that they could be published ten years after they were written, and that happened to coincide with Carlyle's death (Heffer, 1995 p.371).

The description of the tremor in Froude's biography (Froude, 1885 p.390) uses the word 'ateral', which is not in the *Oxford English Dictionary* as such, although it does have "attery", defined as venomous, mixed with gall, malignant, or purulent. Parkinson's disease, the 'shaking palsy', was first described by James Parkinson in 1817. Although in Carlyle's case it was the dominant, right, hand that was affected, in general Parkinson's disease does not seem to be any more likely to affect the dominant than the non-dominant side (Reynolds & Locke, 1971).

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This was one of the worst periods of Carlyle's life. Two days later on 17th June 1871 he wrote that, "for ten days past I have been in such a [bad] state of health as I ever knew in my life" (Heffer, 1995 p.369). The passage from Carlyle's Journal has been quoted by Barsley (1966), who mis-quotes it, instead of having 'windy' having 'wintery', which would be unlikely in June.

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Whether in 1871 Carlyle could have seen men mowing within walking distance of his house in Cheyne Row, is not clear. The time of year was certainly right for hay-making. Whether there were still fields nearby was another matter. A decade or two earlier there almost undoubtedly were, but by 1871 London was rapidly encroaching on Chelsea (Glanville, 1972). Earlier in his life, in the summer of 1845, he had taken long rides as far as Harrow, Kew and Acton, and had watched the harvesting (Heffer, 1995 p.244), and in 1840 he is described as "when taking himself out for walks went over Battersea Bridge and into the country..." (Heffer, 1995 p.210), and in May 1841 he took his walks, "westwads, into the fields past Fulham" (Heffer, 1995 p.213).

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"For a left-hander, eating a meal at a counter can be hazardous; he tends to put his elbow into his left-sided neighbor's soup or sandwich" (http://www.baylorhealth.com/proceedings/12_4/12_4_flatt.htm). Petroski (1994 p.3) comments, "We manipulate knife, fork and spoon as automatically as we do our fingers, and we seem to become conscious of our silverware only when right- and left-handers cross elbows at a dinner party".

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Petroski (1994 pp.15-18) suggests the habit of using a knife in the right hand and a fork in the left, which is probably seventeenth or eighteenth century, evolved from an earlier habit of eating with two knives, which was itself an improvement on eating with only one knife, which invariably meant dirty, greasy, and sometimes burned, fingers. The American style of using a knife and fork, what Emily Post in the 'Blue Book of Social Usage' in the 1920s called 'zigzagging', using the fork in the left hand for cutting, and then transferring it to the right hand for eating, may have arisen from an early colonial habit of eating with a knife and spoon.

The example of dealing cards at a bridge table is given by Cook (1914 p.165).

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For reviews of the writing systems of the world see Diringher (Diringer & Regensburger, 1968), Daniels (1996a), and Coulmas (1996b). There are probably some other minority writing systems which have evolved independently, such as the Mayan and other scripts of central America (Mayan is written from left to right), and the rongorongo of Easter Island, which also is written from left to right.

Pictographs are still with us, and many 'international' signs such as ☞, ☹, ✈, ☺, 🎵, 📺, ☞ and ☞ are frequently used (and also are frequently asymmetric; the symbol ☞ on a tape deck or video machine does depend on one knowing that the tape goes from left to right, an assumption derived ultimately from reading left to right).

The problems of a pictographic language such as Chinese or Japanese are several fold. One is that a Chinese or Japanese character gives no indication of how it is to be pronounced. One hears stories of Japanese businessmen who present their cards to one another but still do not know how to greet each other out loud, because the signs do not say how to speak the name. Another problem is with dictionaries, since there is no obvious order in which to place the signs (unlike our alphabet which comes in an agreed order); in Japanese the solution seems to be to count the number of strokes in the sign, say six, and then search systematically through all the six-stroke signs. It is not an efficient method. Finally, of course, Japanese and Chinese type-writers are notoriously complex, with thousands of keys. The development even of a telegraph system is very complex (and that is said to be why the Japanese instead invented the fax machine). Certainly it is difficult to see how a modern computer could have been developed which used only pictographs.

The very early history of writing continues to be confused and confusing (Lawler, 2001), and new archaeological remains have the potential for overturning many established findings (although dating is not always as clear as it might be).

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The problem of the direction of the ductus is clearly put by Ronald Stroud (1989a): "If the Greeks had learned to write their own language in their own alphabet as early as 1100 BC, ... why do we have to wait over three hundred years for the first tangible evidence of such an achievement?". See also Stroud 1989a p.116. The standard account has been described clearly by Jeffrey (1990a p.43). The theory tends to argue that any inscription which is from

right-to-left must either have been archaic or an atavistic hangover, which is, though, a self-fulfilling theory.

An interesting but somewhat speculative theory to account for the change in the ductus is that of John Skoyles, who suggests that Ancient Greeks read with their right hemisphere, whereas there was a shift over the next half millennium, and Classical Greeks read with their left hemisphere. The result was that right-to-left reading was initially easier, but that later left-to-right reading became advantaged (Skoyles, 1985a; Skoyles, 1988b). The theory clearly has some conceptual overlap with that of Jaynes (1976), who also argued that cerebral dominance in the Classical Greek mind had evolved in comparison with earlier peoples, and that consciousness in its modern form was the result.

One of the longest examples of a boustrophedon inscription is the Code of Gortyna, discovered in Crete. It dates from the 5th century BC, and is the oldest law code in Europe. For an illustration see Farnoux (1996 pp.24-5). Joyce's comment about boustrophedon can be found in *Finnegans Wake* Joyce, 1975 p.18; see O'Shea (1994), who also describes Joyce's 'boustrophedonic writing', palindromic at times, with its reversals of order: "But by writing thithaways end to end and turning, turning and end to end hithaways writing" (Joyce, 1975).

Naveh (1988a) has argued that early Greek would have also contained elements of Hebrew and Aramaic scripts, which were written from right to left..

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There is a third method of writing in boustrophedon, at least in principle, which I have never seen discussed, but would involve reversing the order of the words, but not the letters within words on each retrograde line. Or to put the same thing self-referentially:

There is a third method, in principle at least, of seen never have I which ,boustrophedon in writing discussed, but would involve reversing the order on ,words within letters the not but ,words the of the even-numbered lines which are written retrograde.

In deciding whether letters are, or not symmetric, one has to be careful of the font one is using, because serifs can make letters asymmetric which otherwise might seem symmetric (e.g. 'i') but to a first approximation, only 'i', 'l', 'o', 'v', 'w' and 'x' are symmetric; as for instance in the sans serif font Ariel, e.g. 'i', 'l', 'o', 'v', 'w', and 'x' .

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A Unix/Linux program for printing in boustrophedon can be found at www.vis.colostate.edu/~traevoli/. The program will also produce false boustrophedon if requested, and the retrograde lines can be printed in a different colour to help separate them visually.

The Frere system was developed in 1840, and on the return sweep, from right-to-left, the characters were mirror-image reversed; Moon produced his system a decade or so later, and

the characters on the right-to-left sweep were not mirror-imaged. The method of printing we now call braille, which was invented by Louis Braille (1809-1852) in France in 1829, was only introduced into Britain in about 1870. (www.braille.org/papers/lorimer/chap3.html).

The real problem for boustrophedon is its status in ancient Greek. Is there clear evidence that the script evolved from right-to-left, through boustrophedon, to left-to-right? Anne Jeffrey argued the case most forcefully that there was not. Firstly she argues that there is no proper evidence that archaic Greek was ever written consistently from right-to-left. Individual lines do occur, but they are hardly evidence for a systematic usage of this type of writing. It is as if a Martian came to England, and concluded that English could be written in either direction because sometimes one saw signs such as figure 2:

Figure 2: Inscription on the front of an ambulance.

The image shows the word "Ambulance" written in a bold, black, sans-serif font. The letters are mirrored and appear as if they were reflected in a vertical line down the center of the word. This is a retrograde script, where the text is written from right to left, but the characters themselves are not mirrored. In this case, the word is written as "Ampulance" from right to left, but the letters are not mirrored, so it looks like a normal word written in reverse order.

Although this sign does occur, on the front of ambulances, so that drivers who are being followed by an ambulance can more quickly read the word in their rear-view mirrors, it is hardly typical of modern English script (perhaps the sole exception being the television monitors which are used in the auto-cue systems for announcers produce continuous retrograde, mirror-imaged text, so that the text is the correct way round when reflected in a half-silvered mirror placed between the camera and the announcer).. Jeffrey argues that most retrograde script in archaic Greece was also similar, typically being used in situations where the geometry constrained the way the writing could be put. Many retrograde inscriptions are on walls, over doorways, on pots, or in other places where it makes little sense to write left-to-right. A related practice still occurs in English when poetry is being printed – if a word or two will not fit in to a line, the words are printed at the extreme right hand edge of the page, and not back at the left-hand edge. Jeffrey argued that instead of going through a phase of retrograde writing, Greek writers went straight into boustrophedon: “from the beginning, when more than one line was required, they used instinctively the boustrophedon system” (Jeffrey, 1990a p.45). It must be said that whatever else it is, boustrophedon hardly seems the “instinctive” way of doing anything – except, perhaps, ploughing a field. That the Greeks did use it though seems indisputable (and they would hardly have had a word for it otherwise).

Whatever the precise details of quite how archaic Greek writing evolved, much has been made of the fact that it did so. The last dying throes of boustrophedon were just disappearing at the beginning of the Golden Age of Greece, when classical Greek civilisation set up so many of the institutions and ideas that the Western intellectual tradition takes for granted. Some how it is presumed that being able to write from left-to-right had something to do with it. Jeffery herself puts it down to the majority of the population being right-handed, although most people were probably right-handed long before that time. Writing from left-to-right is “the easiest way to write” for a right-hander, and the majority of the Greek population, as today, would have been right-handed. The important thing about the boustrophedon of archaic Greece was that it allowed writers to try out both right-to-left and left-to-right, when it

would then have become breathtakingly obvious that left-to-right was easier. And somehow the rest is history. It is, I fear, a difficult theory to sustain.

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Inevitably the historical chart over-simplifies many issues, and is itself derived from secondary sources, since I am not an expert, or even an amateur, in any of the highly specialised areas involved. My starting point was the extremely useful figure on p.61 of Healey (1990 p.61), which I have amended and extended on the basis of information in Coulmas (1996b), Diringer (1968), and Daniels and Bright (1996a). Connections between scripts mean that the characters of the scripts themselves show a relationship, rather than that there is a relationship in the languages represented. The difference is important: Urdu is essentially an Arabic script which is being used to represent the Hindu language; and linear B represents the Greek language although the script bears no relation to Greek. Where scripts are shown without any connections it is because their origin is not known, or I do not know it. Needless to say the chart makes no attempt at completeness. I have chosen to omit Chinese and the scripts derived from it, mainly because their direction is principally vertical, albeit with columns that typically go from right to left.

For scripts which have not been deciphered it can be extremely difficult to know whether they are written from right or left or left to right. An excellent account of the difficulties is shown for the enigmatic Phaistos Disk, probably produced in Minoan Crete about 1700 BC (Balistier, 2000).

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Since early scripts are often quite indeterminate in their direction, so that scribes must have had practice writing in both directions, then according to the theory of Jeffrey (1990a) the scribes should rapidly have settled down on left-to-right as being the most natural direction for the right-handers who undoubtedly were the majority of the population in the region (see chapter 9).

Without any direct experience I would have thought that right-handed writing on papyrus would be more difficult if pushing the pen from right-to-left, when it would tend to catch in the fibres of the papyrus, rather than pulling it from left-to-right. But no doubt Herodotus would have agreed with me.

Skoyles (1984; 1985a; 1988b; see also www.users.globalnet.co.uk/~skoyles/right1.htm.) suggests that Ugaritic, which was a cuneiform, alphabetic script derived from Proto-Sinaitic/Proto-Canaanite, was written consistently from left-to-right. Likewise Old Persian cuneiform is also written from left to right (Testen, 1996). It is a nice theory, but the problem is that other early cuneiform scripts, albeit syllabic, such as Hittite and Akkadian, have the same problem of smudging the wet clay, but are not written consistently from left-to-right (Walker, 1990). Following Jeffrey's argument, one would have thought that these early writers, having tried it both ways, would rapidly have realised that left-to-right was better. That they did not suggests that smudging was not the main process driving direction of writing. And to add to the problems, proto-Elamite, also cuneiform, seems generally to have been written from right to left (Englund, 1996). A more detailed analysis creates even more problems for the 'smudging' theory. On a typical cuneiform tablet the writing starts in the

top left hand corner, and follows down the left-hand side in a column, in which the symbols go from left to right. Then, just like a newspaper the text starts again at the top, slightly to the right, and follows down column, and so on, until the right-hand edge is reached. What then happens is interesting; the tablet is turned over (at the bottom edge though, and not the side), and the writing then continues in another column in which the characters read from left to right, *which starts on the right hand side* (Powell, 1981 p.424-5). The next column is then *to the left* of the previous one, and so on, until the left-hand edge is reached. What is clear, here, is that although the individual rows in the columns are written from left to right, the columns on the reverse side of the tablet are written *from right to left*. If smudging were a problem then this would surely not be the way in which it was chosen to write the reverse side.

I am grateful to Professor Marvin Powell of Northern Illinois University for his comment that a left-handed cuneiform writer would have been almost inconceivable in the ancient world.

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Hewes' own conclusion was: "The [quantitative] pre-eminence of left-right scripts, numerically and geographically, is due to a combination of historical, economic and religious factors altogether unrelated to the laterality aspects of the matter" (Hewes, 1949 p.3239). Corballis and Beale (1976 p.107) come to a similar conclusion when they talk about "further doubt whether there is a truly natural direction in which to write".

Gould (1989b) in describing contingency, says, "the final result is dependent, or contingent, upon everything that came before – the unerasable and determining signature of history". He emphasises that contingency is not randomness (Gould, 1989b p.283). It may look like it from the outside, because we are not privy to the details of the decisions made, but to those inside the process there is a clear causal chain which is dependent upon a myriad of tiny but influential events and decisions. To the external viewer or the statistician although much of that gets described as 'noise', it is not actually, but rather is unexplained variation, which is a very different thing indeed.

Some readers may find explanations invoking contingency as in some way unsatisfactory – and perhaps claim that they are not even real explanations. Gould addresses this problem head on:

"I have ... slipped into the rhetoric of inferiority — ... that historical explanations may be less interesting.. . No ... apologies need to be made. Historical explanations are endlessly fascinating in themselves, in many ways more intriguing to the human psyche than the inexorable consequences of nature's laws. ... With contingency we are drawn in; we become involved; we share the pain of triumph or tragedy." (p.284).

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In the past there was certainly not consistency in the United States, and for instance, driving was on the left of the inter-state National Road built in 1806 until at least 1848 (de Luna, 1993).

A modern way of talking about 'custom' is to describe it in terms of memes. As Susan Blackmore (1999 p.7) has put it, "So, for example, whenever you drive on the left (or the right!)... you are dealing in memes".

The traffic rules were more complicated in Goethe's Rome, because there were people who ignored or were excused the traffic rules, just like the members of the Politburo in the old Soviet Union who were said to ignore all red traffic lights. In Rome, Goethe tells us, “Ambassadors have the right to drive in either direction down the middle of the street”. (Goethe, 1970 p.448).

The gridlock in eighteenth century Paris was followed by another recognisably modern phenomenon which followed: “The result was road rage. In one particularly nasty incident at the Places des Victoires in 1766, a furious nobleman leaped out of his carriage, drew his sword, and buried it in the belly of the horse attached to the carriage blocking his. He was the Marquis de Sade.” (Darnton, 1999).

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A physical model of the process of streaming when particles have their own intrinsic powers of movement, due to Helbing *et al*, is described by Buchanan (2000).

Although lawyers have rarely looked at the legitimacy of governments imposing a rule of the road, Adams (1996c) has published a devastatingly satirical piece on the mythical country of Idd, which drove on the right originally, but where immigrants with different belief systems started driving on the left. A pragmatic compromise was reached for a while in which liberal Iddians and recent immigrants were allowed to drive on the left between 1 a.m. and 5 a.m. in secluded areas. Further compromises were then reached in which most Iddians drove on the left but some were ‘exempt’ because of their historic belief systems and were allowed to drive on the right. The inevitable outcome was carnage on the roads. Adams chilling conclusion is that, “only pragmatism or utilitarianism can be the basis of law once a dominant morality evaporates, and neither philosophy is compelling enough of a justification for most to defend the rule of law against dogmatic idealists ... [W]ithout consensus about fundamental values, democracy collapses, regardless of what judicial and legislative countermeasures are taken. It happened in Idd and it will happen in the United States”.

In Nabokov's *Lolita* it was driving on that “queer mirror side” which was also Humboldt’s inevitable downfall, because it simply could not be ignored, particularly once he drove into town (Nabokov, 1995 p.306).

☞ WWW ☞ 10:19

Feldman (1987 p.238) put it clearly, and also showed another misapprehension about Britain: “Why do the English [sic] drive on the left and just about everybody else on the right?”.

In preparing the maps and writing this section I am indebted to two excellent web sites: www.travel-library.com/general/driving/drive_which_side.html, and www.mmailbase.ac.uk/lists/int-boundaries/1999-09/0000.html, both of which draw heavily on Kincaid (1986a p.198). The percentages are for the early 1980s by Kincaid who also estimates 23% of the road mileage, 18% of motor vehicles, 34% of territories and 30% of independent territories were then driving on the left.

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The fact that the Maritimes followed Britain does beg the question of why, and for how long, Britain has driven on the left. Kincaid (1986a p.11) says he was unable to find out anything about ancient driving habits. An intriguing exception has recently been found in Roman Britain. The Romans excavated a large quarry at Blunsdon Ridge near Swindon in Wiltshire. The old road is still visible, and the ruts on the left hand side of the road are far deeper than those on the right, presumably due to the far heavier carts leaving than entering the quarry. In this little corner of the Roman Empire, driving was on the left (Kennedy, 1999).

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Intriguingly the 1904 Baedeker guide to Italy only talks about cyclists. The idea of travelling by motor car appears in the 1913 guide.

A typical example of the question about driving on the right or left was in New Scientist's *The last word* for 23rd October 1999, which can be found on their web-site, www.last-word.com.

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Although the change in the rule of the road in Austria is declared as being 'overnight' in some accounts, in fact the *Anschluss* was on 12th March 1938, the proclamation was issued on 18th August, and the changeover occurred at 00:00 on Monday 19th September (Kincaid, 1986a p.50).

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There seems to be some confusion over quite when Myanmar (Burma) changed this side of driving, since although Honour (1995) refers to it as 'recent', Kincaid (1986a p.52) suggests it was probably in 1970.

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This was not an easy map to produce, and it is heavily dependent on that of Kincaid (1986a pp.196-7). The borders are the same modern borders as those shown on the map for 2000, despite some having changed in the interim. Nevertheless it should give a good idea of the amount of change over the past century. The year 1919 was chosen by Kincaid (1986a p.198) because it was probably the one in which the largest number of people drove on the left, about 33.7% of the world's land area of 52.4 million square miles. An interesting thought is that if none of the countries shown in the 1919 map had changed their rule of the road, then given current population sizes, about 64% of the world's population would presently drive on the left. That figure is however very influenced by China, which contributes about 20% of the world's population. Excluding it, then about 54% would drive on the left.

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Ising glasses were developed by the mathematical physicist Ernst Ising (1900-1998), who for understanding magnets (www.bradley.edu/las/phy/ising.html; www.swin.edu.au/chem/complex/vp/vp06/vp06.html). In a magnet each little domain can be considered as

being a tiny magnet in its own right, each with its own north and south pole (Stein, 1989). To start with, in an unmagnetised piece of iron, they point in all directions at random. As the iron is magnetised so the individual domains come to be aligned one with another. The crucial feature from our point of view is that each little domain is also influenced by those around it. To be a little domain facing north is difficult when all around are facing south. A little push and you too will face south as well. This is actually a good model for social and economic interactions as well (Arthur, 1990). For an interactive model of a two-dimensional Ising model see bartok.ucsc.edu/peter/java/ising/ising.html.

For a description of Conway's game Life see Holland (1998). There are also close links to neural networks (see www-perg.phast.umass.edu/perspective/NeuralNetworks/NeuralNetworksEssay.html).

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This property of the world can be easily visualised if one takes the map, rolls it up in a tube, and then twists the tube around in a circle until the ends join. The final product looks like the sort of doughnut that has a ring in the middle. Whenever one goes off one edge of the map one comes straight back on to the opposite side. Not having any edges makes many calculations of this sort much easier and more elegant. Of course in the real world edges are problematic precisely because they are different and interesting.

☞ WWW ☞ 10:28

Left-right symbolism is, needless to say, strongly developed in *Chirenia*; so it is not surprising that heads is right and tails left, or white is right and black is left. However the Chirenese had to resort to tossing a coin to decide whether to drive on the right or left because the Dextralist party argued that driving on the right side of the road was clearly better because the car was on the right, whereas the Sinistralists argued that driving on the left was self-evidently better because it meant that the driver was in the right-hand side of the car. Civil war was eventually avoided only because of a strong Federal president who showed that coin-tossing was the only fair way to resolve the impasse.

Lest it be thought that I have carefully chosen this example to give a 'good' result, I should say that it was in fact the first one I tested. The only thing I did do was shift the output so that the black blob was nicely centred. I also ran a further 50 replications. In none of them did white or black completely dominate the situation (i.e. fixation of white or black, with 0% or 100% white). The average final percentage of white was, not surprisingly, very close to 50% (48.2%), but the distribution was, again unsurprisingly, much wider (standard deviation = 20.8; range = 8 to 96) than was the starting distribution (mean white = 49.4%; standard deviation = 5.7; range = 36 - 62). A stable configuration appeared in an average of 5.7 cycles (SD 1.9; range = 3-14), and in 88% of cases there were two separate areas; in the remainder there were three (an area was defined as single if one could drive from any cell in it to any other while staying on the same side of the road).

Perhaps the most surprising thing about the Chirenia simulation is that in the 50 replications the smaller, minority area represented an average of 32.3% (SD 10.8) of the total area, which is remarkably close to the 33.8% of the world's population who currently drive on the left. Although at first the fact there are always two or more areas might also seem surprising, it

comes about because of the criterion of a *clear majority* of neighbouring regions going the opposite way. Any particular region is surrounded by eight other regions, and hence four can drive on the right, four on the left and the situation will be stable, neither right nor left attaining a majority amongst the neighbours.

Whether the Chirenian simulation is a good model for predicting the real world does depend in part on the continued existence of right and left hand drive cars. Should monopolistic multinational car manufacturing companies decide autocratically to rationalise production and only produce left-hand drive cars then that might put additional pressure on countries that drive on the left. Having said that, the existence of places such as Cyprus and the US Virgin Islands where most people drive on the left in left hand drive cars suggests that there may still be stability.

An interesting pressure on the minority of countries that drive on the left occurred, as in Britain, with DaimlerChrysler's Smart car, which when it was introduced into the UK came only in a left-hand drive version, as in the rest of Europe. At first that might have seemed to be a sign that manufacturers would prefer to produce only left-hand drive cars, thereby putting pressure on countries driving on the left to drive on the right. The ease with which drivers adapted to a left-hand drive car while driving on the left might also have decoupled the side of the road for driving and the side of the steering wheel. However in October 2001 DaimlerChrysler announced that it would be producing a right-hand drive version for sale on the British market (*The Guardian*, October 15th, p.21).

☞ WWW ☞ 10:29

Gould (1908) puts forward a lengthy and complex case that right-eyedness is the predominant reason for driving on the right being the natural way. But he wrote extensively on eyedness, arguing that it was a neglected aspect of behaviour and the basis of all sorts of pathologies (e.g. Gould, 1904).

Whether early cars were all built with their accelerator on the right and clutch on the left would be worth following up. Just as early clocks were not all built to go clockwise (see chapter 12), so it is possible that early cars, particularly those built individually by left-handed enthusiasts, might be reversed.

☞ WWW ☞ 10:30

Leeming (1969a) is cited by Kincaid (1986a pp.25-7) as finding that countries which drive on the left have a lower accident rate than those that drive on the right. The effect is large, the order of about a third, but does not seem to have been studied any further. However the statistics presented by Leeming are relatively limited and very selective. Kincaid speculates that any effect if present could be due to the driver's right eye being closer to the oncoming traffic. I analysed numbers of road accidents for the 62 countries reported in the *Economist* book of world statistics for 1985-88 (The Economist, 1990) in relation to log total population, log area of the country, log miles of road and log number of vehicles, as reported by Kincaid (1986a) for the year 1982 or thereabouts. The log of the number killed per annum was very significantly related to population size and number of vehicles. The 15 countries driving on the left had a very slightly lower rate of accidents (0.25%), but the very small effect was nowhere near statistical significance. A similar negative result was found for the number of

injuries per annum. It can be concluded that accident rates do not differ in relation to driving on the right or the left.

☞ WWW ☞ 10:31

The situation for pedestrians seems in general to be one of mild anarchy (Kincaid, 1986a pp.37-9), and although attempts have been made over the years to impose a rule of the road it generally has had all the success of herding cats. In the narrow medieval streets of Siena I have seen an old sign, probably nineteenth century, saying 'Pedoni a sinistra', although there was little evidence of note being taken note of it. One of the rare exceptions which is observed, at least by Londoners who get very annoyed with tourists who do not understand it, is the habit of standing on the right and overtaking on the left on the escalators on the Underground. Occasionally claims are made that pedestrians naturally 'drive on the right', be they American or British (Mestel, 1998), but it is doubtful that there is any universality.

As far as horses are concerned, Kincaid (1986a p.3) mentions that the practice of leading a horse with the right hand from the left side "appears to be universal". Charles Darwin also mentioned "the difficulty of getting on a horse on the left side ... because [the human] leg is right handed" (Barrett et al., 1987 p.533). Xenophon in his *Art of horsemanship* gave instructions on getting on an off a horse which presumed most people were right footed (Gould, 1908 p.35), and likewise Bell (1834 p.143) comments that "The horseman puts the left foot in the stirrup and springs from the right".

The 'rule of the road' seems to be universally applied for ships, as far as I am aware, and specifies precisely who has right of way and how ships should manoeuvre in a myriad of complex situations.

Hamer (1986b) discusses trains, as also does Kincaid (1986a p.39-41). Gould (1908) has a good account of the confused situation in America at the beginning of the twentieth century. Although railways largely follow the same habit as roads, the most prominent exception is in France, where trains run on the left, probably because the first railways were built by a British engineer, Thomas Brassey. The trains in Alsace Lorraine, which was annexed by Germany in 1870, were built by German engineers and run on the right, and at the pre-1919 border there are flyovers (*saut de mouton*, sheep's jumps) to swap the trains from one side to the other.

Aeroplanes, despite their external symmetry, show a number of internal asymmetries, of which the most obvious are that the captain always sits on the left, and passengers always board from the left at international airports. Most of these asymmetries seem to arise from early aeroplanes being 'mounted' in much the same way as a horse, from the left, and from the right-handedness of the pilot, who wishes to have the centrally placed joystick in his right hand. To confuse matters, helicopter pilots are seated on the right side of the flight deck (see discussion in *New Scientist*, 'The last word', 22nd April 2000).

I heard about the Monster Raving Loony Party's manifesto from Steve Jones, but have unable to find it anywhere in writing. However a glance at the Monster Raving Loony Party's manifesto for the 1997 general election (freespace.virgin.net/raving.loony/sutchmanif.htm), written by the late Screaming Lord Sutch, will confirm that the transport policy shares a coherent philosophy with the party's other policies.

☞ WWW ☞ 10:33

The full entry in Carlyle's journal on the universality of right-handedness reads:

“It is curious to consider the institution of the right hand among universal mankind; probably the very oldest human institution that exists, indispensable to all human co-operation whatsoever. I wonder if there is any people barbarous enough not to have this distinction of hands; no human Cosmos possible to be even begun without it. Oldest Hebrews, &c writing from right to left, are as familiar with the world-old institution as we. How old? Old!” Froude, 1885 vol II, pp. 407-8

Pye-Smith starts out by rejecting any direct effect of the heart upon handedness, since “by an examination of the chest in left-handed persons it may readily be seen that most of them at least have their hearts in the right place”. He then carries on:

“If a hundred of our ambidextrous ancestors made the step in civilisation of inventing a shield, we may suppose that half would carry it on the right arm and fight with the left, the other half on the left and fight with the right. The latter would certainly, in the long run, escape mortal wounds better than the former, and thus a race of men who fought with the right hand would gradually be developed by a process of natural selection. Such a race would naturally use the right hand also when they discovered how to draw and to write...”. Pye-Smith, 1871

Pye-Smith (1840-1914) who published his paper in the middle of 1871, at much the same time as when, on June 15th 1871, Carlyle went out for that morning walk, had a distinguished career, going on to become FRCP, FRS, and Vice-Chancellor of the University of London. After taking a degree in Classics at University College London in 1858, he went on to take his medical degree at Guy's in 1863, and then to study in Paris under Trousseau, Berlin under Virchow, and Vienna under Hebra. T H Huxley is said to have described him as “the best educated young man in London”. Given the overlapping of the social circles of the Huxleys, the Darwins and the Carlyles it seems at least feasible that Pye-Smith and Carlyle both talked about the shield theory. It is also more than possible that the idea was generally in the air, since more than a decade earlier, “C.H.P.” (1856) had commented that “the possible protection afforded by the unemployed left hand to the side where the most important organ of the body is placed, has also been, perhaps fancifully, assumed as a final cause of [right-handedness]”. The comment is interesting in that it occurs before the publication of Darwin's *Origin of Species*, which has been presumed to trigger the ‘shield’ theory.

Although there is no direct evidence that Darwin himself ever considered the shield theory, we do know that in August 1878 he was in correspondence with A.L. Adams who mentions to him a theory that deer have larger left antlers than right, “possibly for protection of [the] heart”. As far as I am aware, Darwin's reply does not exist.

☞ WWW ☞ 10:35

There is no doubt that left-handed batters are particularly common in baseball, 31% of major league players (excluding pitchers) batting left-handed, compared with 9% of high-school players. In addition 12% of major league players batted with either hand (switch-hitters) compared with 2% of high-school players. Whether the asymmetry of the game itself can entirely account for the effect is not clear as there is a suggestion that professionals who bat left *and throw left* have higher batting averages than those who bat left and throw right, whereas of course both should be equally advantaged by tactical advantages and being closer to first base (McLean & Churczak, 1982).

A film of Babe Ruth, the left-hander, can be seen at www.baseballhistorian.com/html/babe_ruth.htm, where the advantage of the left-hander can be clearly seen as Ruth runs towards first base.

I have heard it suggested that golf courses are organised asymmetrically, the greens tending to favour right-handers. That would certainly be compatible with claims that only one golfer playing left-handed has won a major¹ (Billings, 1994), and that there is a dearth of left-handed golfers at top levels of the game (Aggleton & Wood, 1990b).

It has also been claimed that horses themselves are not symmetric, about 75% preferring to lead with the left fore foot (Gray, 1989); see also www.horseshoes.com/advice/egray1/eqnasmdx.htm. Greyhounds suffer a far higher rate of fractures of the right navicular bone in the ankle, as a result of the extra stress put on it because it is on the outside of the curve (Johnson et al., 2000). Whether human athletes have the same problem is not clear. There is however no doubt that bone re-modelling does occur in humans once the loading of the two legs is not symmetric, as for instance after a stroke on one side (JØrgensen et al., 2000).

Sometimes although left-handedness is not explicitly forbidden, it is sometimes discouraged. For instance in the Shotokan style of karate there seem to be almost no masters who are left-handed because the 27 basic forms are themselves intrinsically right-handed (Layton, 1993). In diving, although there are no specific rules about direction, Coren has described how left-handers some times score less well because their anti-clockwise spirals look less slick to judges used to the more common clockwise spirals of right-handers (www.ausport.gov.au/fulltext/1998/sportsf/sf980227.htm).

WWW 10:36

Wood and Aggleton (1989c) looked at 167 goalkeepers, 9.6% of whom were left-handed. Aggleton and Wood (1990b) also found that amongst 100 professional darts players only 3.8% were left-handed, slightly less than expected.

Amongst top ten-pin bowlers, Aggleton and Wood (1990b) found that of 131 males and 213 females, 9.9% and 6.6% were left-handed. Although ten-pin bowling seems symmetric (as long as the holes in the ball are appropriate for a left or right-hander) there is an argument that because most bowlers are right-handed then the lanes become subtly worn in the typical curving path of a right-hander, then this provides a slight advantage for a left-hander who can find a 'sweet spot' on the left hand side of the lane. The argument of course can also be reversed to say that right-handers typically throw in a track left by their fellow right-handers.

There is a suggestion that left-handers may more often be clumsy or dyspractic (Gordon & McKinlay, 1980 p.6, Gubbay, 1975 table 4.37). Sir Cyril Burt attracted much bad press from left-handers for his description in the 1930s of their motor abilities: "They squint, they stammer, they shuffle and shamble. They flounder about like seals out of water, awkward in the house and clumsy in their games. They are fumlbers and bunglers at whatever they do..."

¹Bob Charles in the 1963 Open Championship.

(Burt, 1961 p.287). He was however describing a sub-group whom he called “the ambisinistral”, a sub-group for whom there seems to be good statistical evidence. Dorothy Bishop has shown that amongst left-handers there is a group in whom performance in the non-dominant hand, the right hand, is much worse than is performance by right-handers using their non-dominant hand, the left (Bishop, 1980, Bishop, 1990). Since many skilled tasks involve co-ordinating the right and left hands this probably means that left-handers are more likely to be found in a group of clumsy (dyspractic) individuals.

WWW 10:37

Although in the past tennis has been a symmetric sport, Neale Fraser, a champion from the 1950s (www.ausport.gov.au/fulltext/1998/sportsf/sf980227.htm) points out that that is not quite the case now:

“But the biggest advantage I think has only come about since the advent of the tie-break. In the tie-break, ... after the first point when you change serves, the service person starts in the second court all the time, and that's the left-hander's most favoured side. Conversely, when the right-hander is playing and has to serve, he is serving into the second court which is not his favoured side. So I think the tie-break favours the left-hander.”

In 1998 it was claimed that 19% of men and 11% of women on the international tennis circuit were left-handed, compared with 12% of men and 8% of women in the population in general. (www.ausport.gov.au/fulltext/1998/sportsf/sf980227.htm). However Wood and Aggleton (1989c) in their survey could find no consistent excess of left-handers, and before 1954 questions were asked as to why left-handers in tennis were so rare (Buss, 1995). Taking all of the results together there probably is an excess of left-handed tennis players (Raymond et al., 1996d). There does however seem no doubt that there is an excess of top table tennis players who are left-handed (Raymond et al, 1996d), and a similar excess may also be found in badminton (Raymond et al, 1996d).

The advantage in competitive sports is perhaps not restricted to top level players. Alison Brace of Walthamstow, described for instance:

“As a teenager I played a lot of badminton. I found being left handed an advantage as it was often off-putting for my opponents. They would play what they thought was my backhand and would be surprised when I could return the shot so easily”. (Vestry House exhibition, see Sadler, 1996).

In baseball there has been a continual evolutionary battle between right and left-handed pitchers and hitters which has been well-documented due to the quality of the historical statistics available (Flanagan, 1998, Goldstein & Young, 1996). In cricket there have been seven separate occasions in which the England test team no less than five of the eleven players have been left-handed (Anonymous., 1993). The Australian test team from 1877 to 1998 is said to have had 17% of its bowlers and 20% of its batsmen left-handed (www.ausport.gov.au/fulltext/1998/sportsf/sf980227.htm). However Wood and Aggleton (1989c) could not find an excess of left-handers amongst batsmen, only amongst bowlers, although Raymond *et al* suggest there is also an excess of left-handed batsmen (1996d) and not batsmen.

The tactical advantages of the left-hander were recognised long before the advent of modern sport and were particularly apparent in that most obvious substitute for lethal battle, fencing². In 1747, Captain John Godfrey clearly stated how left-handers were advantaged:

"I cannot help taking notice that the left-handed Man has the advantage over the right-handed, upon an equal footing ... in both Small and Back-Sword. I would rather contend with the right-handed Man with more judgement, than the other with less". Cited by Harris (1990 p.204).

Similar, in July 1892 the Italian master fencer Eugenio Pini, from Livorno, fought the French Master Pini. A report of the time showed the problems that Pini faced:

"Rue, the Parisian fencer, is a left-handed man, who fences with much steadiness and calm, and many of Pini's favourite attacks were rendered useless owing to this peculiarity of left-handedness. It is generally admitted that the Cav. Pini is superior to any French fencer". (users.townsq.com/ale/gugler.htm).

Pini himself had a rather eccentric but very effective style, which was described in *The Graphic* of 2 July 1892:

"The position taken up by the Cav. Pini is a very curious one. He leans forward with his head low, his right foot well in front of him, and his left hand hanging loosely near his shoulder. On guard, he holds his foil nearly upright, and his attack is marvellously rapid and dashing. He is at all points at once, his blade flashes round his adversaries and threaten in every position, so that the artist has endeavored to give some idea of the rapidity of his play by marking in dotted lines the quivering of his foil."

The reasons for the advantage of left-handed fencers were apparent even before the first World War, Theodore Cook putting it very straightforwardly: "left-handed fencers ... have far more opportunity of practising against right-handed men than we have of getting used to them" (Cook, 1914 p.243).

🔊 WWW 🔊 10:38

If the incidence of dyadic fighting has decreased over historical time then one would expect the incidence of left-handedness to have come down, whereas the incidence actually seems to have been mostly constant with some increase in the incidence of left-handedness. The size of any frequency-dependent selection will also depend on the number of fights, the proportion of left-handers, and the proportion of fights which result in the victor rather than the loser successfully having offspring. The effect could be very small overall, although given a large enough length of time that is no objection to such a theory as small effects can still become fixed.

Even if the advantages of fighting from the unexpected or the stronger side perhaps haven't influenced the evolution of left-handers, is it possible that they have determined other historical moments? The Battle of Hastings in 1066 is a defining moment in English history which every British school child is supposed to know about³. What has left and right got to do with it? One of the mysteries is quite how so few English, who were outnumbered three to

² Since in part this book has been inspired by Osbert Sitwell's *Left Hand, Right Hand!*, I feel I must emphasise here that Sitwell himself learned to fence, in Italy, and with the left hand at that (see also chapter 11).

³ Actually only 64% of a representative sample of British adults aged 25-34 knew what happened in 1066, with the proportion rising to between 73 and 78% of those aged over 45 (Anonymous, 2000).

one by the Normans, managed to fight so effectively and for so long. A possible solution is that the Normans approached the English line diagonally and from the left. The result was the English axemen could brace their right foot, and swing the axe forcefully to the left, their stronger side (Wheeler, 1988 p.134)⁴. Although it didn't change the outcome in that case, on such left-right differences the course of history might sometimes have flowed.

☞ WWW ☞ 10:40

Brodie also comments that “We know that some individuals are left-handed, but the proportion of them is very small, and I am not aware that there has ever been a left-handed nation.” (Brodie, 1862). He actually attributes the low proportion of left handers to their general difficulty in co-operating with others, and therefore anticipates Carlyle’s comments on the mowers. Brodie (1783-1862) was a very distinguished surgeon, being not only President of the Royal College of Surgeons, but also of the Royal Society, the first surgeon to be so. He was the Royal Society’s youngest winner of the Copley Medal at the age of 26, but for researches on the role of the brain in maintaining body temperature and the action of the heart which have since been described as having an “impact out of all proportion to their theoretical importance” (Goodfield, 1970). He is remembered now only for the eponymous Brodie’s abscess, an increasingly rare form of chronic osteomyelitis.

Potentially it is not only left-handed surgeons who are disadvantaged in medical practice. Traditionally patients in bed are examined with the doctor standing on the patient’s right, a position which is convenient for a group of right handers but inconveniences the left-hander in their midst, and could be seen as discriminatory (Roper, 1999).

The idea that left-handers are rare amongst surgeons, is denied by Hugh Dudley who was Professor of Surgery at St. Mary’s for many years, although his comments about ‘accommodation’ suggest there is potentially a real problem:

“I have known many surgeons who are left-handed and some of them are at the top of their field. True, they may have difficulty in relating to a predominantly right-handed team but my experience is that the assistants and, most importantly, the scrub nurse ... are always prepared to modify their approach to accommodate someone who is skilled but contrary as far as their handedness is concerned.” Dudley, 1995.

In good Hippocratic tradition, Dudley also comments that “I am ambidextrous.... This has great advantages for a surgeon though it can cause confusion in assistants. Nevertheless I found it useful throughout my professional career and did not think that it gave rise to difficulties with my team.”

☞ WWW ☞ 10:41

Although Hendrix usually played with the guitar strung conventionally for a left-hander (i.e. the bass strings at the top), he was known on occasion to pick up a right-hander's guitar, turn it over, and improvise on it, despite the bass strings now being at the bottom. In playing

⁴ Of course the Normans would also have the English on *their* left side, with the same advantage to right-handers, and so the argument depends critically on the advantage of the static English over the advancing Normans, who were also moving up hill. Whether the size of the effect is large in practice is an interesting question.

the guitar upside down, albeit restrung, he did have to use the tremolo arm in a very atypical position.

Chaplin not only played the violin left-handed in *Limelight* (1952), but did so also in *The Vagabond* (1916). In his autobiography, Chaplin describes how, “As I played left-handed, my violin was strung left-handed with the bass bar and sounding post reversed. I had great ambitions to be a concert artist...” (and he practised four to six hours a day) (Chaplin, 1964 p.131).

Barsley (1966 p.142) says that James Barton, who used to play violin left-handed with the Allegri Quartet, suggested there were aesthetic and practical advantages in having one of the violins in a string quartet playing left-handed since the two violinists face inwards towards the other players.

Oldfield (1969b) also says he has never seen a left-handed string player in an orchestra. Occasionally though musicians do play instruments 'the wrong way round'. A very unusual example is Reinhard Goebel, who gave up being Konzertmeister of Musica Antiqua Köln in 1990 at the age of 38 as the result of a paralysis of the left arm, due to focal dystonia ((www.eubo.org.uk/ebo_biogs.htm; greentea.unl.edu/shop/text/nyt.txt). He subsequently re-learned the violin left-handed, and is once again conducting, although now from the second violin's desk, presumably to prevent violent confrontations with the bows of the other violins.

As well as studying the handedness of instrumentalists, the research also looked at ten leading choirs and a similar slight excess of left handers was found (Aggleton, Kentridge, & Good, 1994). An elegant feature of the study was the use of an age and sex matched control for each musician from a study of the general population (Ellis, Ellis, & Marshall, 1988). An earlier study by Oldfield (1969b) of students in two university schools of music also found a slight but non-significant excess of left-handers amongst musicians.

WWW 10:42

As with all usages of right and left there seems to be an arbitrary component in the description of the National Assembly – is it left and right from the point of view of the members themselves or from the perspective of the Speaker or the King. Parkin (1996 p.69) cites Dumont's description, that the “traditional social order was expressed by seating which proceed downwards from the king ... [so that] the first two estates took the right side of the chamber, leaving the negatively valued left side to their social inferiors, the third estate, who rapidly became associated with radicalism. The upshot was that the right, originally standing for innovation and newness, became the side of political conservatism and stability, while the left, originally ‘caring, reproductive’ became the side of revolution and chaos”.

The OED cites James' *Will to believe* as the first usage of left wing in which he says, “In theology subjectivism develops as its ‘left wing’ antinomianism”; also while discussing Hegelian gnosticism James says “... it would certainly develop its left wing here as there and produce a reaction of disgust”. A more recognisable usage is by Bodley in 1898, “...the Socialists, who now compose the Radical left wing”.

☞WWW☞ 10:43

Studies of attitudes towards social, political, moral and ethical issues tend to find that two dimensions are better for descriptive purposes. One dimension is the usual left (radical) versus right (conservative), whereas the other dimension has been called toughminded - tenderminded. Tenderminded people have their political beliefs but are little inclined to impose them on other people, whereas toughminded people are willing to do what is necessary, often against opposition, to impose their views. Since the far right and the far left both tend to be toughminded it has been said that the political spectrum may be better viewed not as a line but as a horseshoe or even as a circle, the two extremes becoming so similar that they almost join up once more (Eysenck, 1954).

☞WWW☞ 10:44

The spectrum of colours does also provide a quasi-spatial dimension, of wavelength, and it has also been used for describing politics with red at the radical end and blue at the conservative. It has the advantage of leaving a host of other terms and colours for other political positions (pink, green, etc.).

☞WWW☞ 10:45

According to Domhoff (1968 p.594), the ones who sat on the right, “were identified with the King-Father and his rightist values. They were part of the fatherhood - the ruling class. On the other hand, the capitalists and dissident intellectuals were on the left – a brotherly grouping espousing brotherhood and mother-derived values – because they were at that time the rebellious young upstarts who had not developed an identification with the patriarchal trappings of the French monarchy”. The favoured ones also sit to the right hand of God in the Bible, and in a range of African cultures it is common for the favoured one to sit to the right hand side of the leader (Wieschoff, 1938).

Although in general in southern India each caste tended to be either right-handed or left-handed (Beck, 1970; Brimnes, 1999), an intriguing exception is the Mālas, the ‘untouchables’, amongst whom there are both right and left-handed sections (Nicholson, 1926).

☞WWW☞ 10:46

These ideas on the relationship between cerebral functioning and the difference between left and right political groups were first proposed in an unpublished manuscript by Tucker (1985b). The work on seating patterns and personality is by the Gurs (Gur, Sackheim, & Gur, 1976; Gur & Gur, 1975).

☞WWW☞ 10:47

Figures in the original article were to one decimal place (Mair, 2000). Clearly many difficult judgements have had to be made in constructing this table but one presumes that they are precisely those for which a Professor of Comparative Politics is best suited, and that there would be reasonable agreement if other experts carried out the same task. For our purpose the important thing is that the original author did not know that they would be used for the present analysis, in particular for the relative numerical proportions of right and left.

☞ WWW ☞ 10:48

Pollyanna explains the game in more detail in the book. The idea, “was to just find something about everything to be glad about – not matter what twas”. For instance, a friend complains that there is not much to be glad about when you had hoped to be given a doll as a present and in fact had received a pair of crutches. Pollyanna replies, “why, just be glad because you don’t need ‘em!”.

My feeling is that Pollyanna is little known outside of the US, although an internet search suggests that being ‘Pollyanna-ish’ is a common phrase there. The concept is much older though, and in European thought it is less an uplifting if unctuously saccharine moral tale for children than the ironic and hard-hitting attack of Voltaire’s *Candide* on the church. In modern British thought the concept is now most likely to invoke the Candidean scene at the end of *Monty Python’s Life of Brian* in which the crucified criminals sing, “Always look on the bright side of life”. Or alternatively the Skip James song recorded by Cream, the majority of whose lyrics consist of “I’m so glad, I’m so glad, I’m glad, I’m glad, I’m glad” – a sentence that seems to be parsable in surprisingly many ways.

☞ WWW ☞ 10: 50

Claude Shannon, who was born in 1916, died on 24th February, 2001.

Mathematically if an event has a probability, p , then the information received from that individual event is $\log_2 (1/p)$. The average information, H , from a series of such events is $p.\log_2 (1/p)$. The maximum information can be calculated by differentiating H with respect to p , and setting $dH/dp=0$. The maximum information occurs when $p=1/e = .3678$. There is also a theory that the proportion is close to the Golden Section (0.6180: 0.3820), which has been invoked in many different contexts (McManus, 1980; McManus & Weatherby, 1997), although separating the predictions is not easy – see Tuohy and Stradling (1987).

It might be worried that the calculation above only considers one of the possibilities, the one with probability p . In practice there is a second alternative event, that not- p occurs; that it is not raining in other words, which occurs with probability $(1-p)$. If so then the *total* information is $p.\log_2 (1/p) + (1-p).\log_2 (1-p)^{-1}$ and the maximum information then does indeed occur when $p=.5$. Berlyne (1971), following Frank, emphasises that $p.\log_2 (1/p)$ is the “strikingness” or “penetrance” of each individual contribution to the total information, and is the proper measure. To be told in the desert that it is not raining is hardly a useful outcome.

☞ WWW ☞ 10:51

Carlyle's thought was much more subtle than the simplistic labels of 'proto-fascist' which were subsequently applied to it (Heffer, 1995 pp. 19-25).

Carlyle would also have been wary of the need for statistics for looking at many of the issues raised in this chapter, and indeed in the book as a whole. In his essay on *Chartism* he recognises that mere numbers alone, mindless counting, do not give knowledge:

“Statistics is a science which ought to be honourable, the basis of many most important sciences; but it is not to be carried on by steam, this science, any more than others are; a wise head is requisite for carrying it on..”

As someone who teaches and uses statistics extensively, I can only agree profoundly with the statement.

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