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I BELIEVE...

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My initial response to the editor's request for a contribution to this series on *I Believe* was 'not much'. However, after a little of what passes in my mind for thoughtful reflection, I came to think that my paucity of beliefs was not entirely an intrinsic state but more the outcome of the 'action-orientated' life that clinicians, and particularly surgeons, tend to live. A professional career spent in *doing* rather than *contemplating* does not leave much time for reflection although this could be regarded as a poor excuse—more thought might lead to better deployment of plans of action. In addition, short-term thinking to anticipate and to solve (one hopes) day to day problems, crowds out longer term contemplation of our nature and *being*. In the British of my generation this has been combined with reticence and also a faint embarrassment about being committed to something without having evidence to support it. For that is what, in my view, constitutes a 'belief'. It could equally well be called a starting point, assumption or value, 'givens' or standards which preside over the way we conduct our lives. I leave to others any debate on whether these things are built in to our biological nature (*hard wired* in modern jargon) or acquired by cultural exposure, although I favour nurture rather than nature. The latter carries with it Jungian-like creation of a collective cultural attitude which is inherited through social, rather than strict, biological means. However, I think that what is now fashionable to call neo-Darwinism would seek to blend cultural change with biological on the grounds that advantageous social adaptations to the environment favour certain individuals and so lead to their selective success.

Beliefs are largely positive; lack of them is negative and dismissive but nevertheless often easier to state. The latter are often founded on scepticism to which I will return. Among my 'not-beliefs' is the lack of a conventional religious one. Our observations of the Universe 'out there' (believing as I do that there are grounds—although as Bishop Berkeley was inclined to think uncertain ones—for thinking that there is such a Universe), makes me consider that things are too complicated to be explained by adherence to the concept of a God or gods such as those specifically created by individual religions. Religions may be a necessary part of our social existence and can occasionally set moral guidelines which are of importance in our reactions to others. However, although there may be religious purpose in a world of chance¹ and this may ultimately yield a better understanding of our position in the nature of things, I believe that we

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should continue to look for more open and developmental explanations of the enormously complex universe, even although these may continue to escape our complete comprehension. One of the fascinations of a life which explores explanations is that it is open-ended, and however often we think we have solved a problem, the more often new issues arise. It was G. H. Hardy who made this point about mathematics. Some would say that, given this limit to complete understanding, 'Why bother?' This is not an easy question to respond to, never mind answer, but I agree with Rudolph Steiner that a quest for explanation—what he regarded as 'an obsession with objective and abstract truth'—is part of 20th century man's inheritance.² Put somewhat simply, the scepticism that is modern science is my religion.

Given the primacy for me of the scientific approach, there is a need to define it. I have struggled with this all my professional life. For the most part scientists (and I include clinical scientists, though this is a matter which is subject to much debate and one to which I will return) work inside what Kuhn³ has called 'conventional' science. That is they accept a conventional wisdom,⁴ often inherited from their teachers, and thereafter spend their time, within its self-created boundaries, worthily solving problems (Kuhn preferred the word *puzzles*). Clinical science in 1996 is particularly wedded to this approach because there is so much to do as more 'basic' (and I use this word in an artificial hierarchical sense) sciences are applied to the problems of medicine). In consequence there is little need to question the underlying structure that governs the prosecution of current medical and biological⁵ research. However, on the one hand Science and on the other hand Scientific *Advance* are different. Karl Popper⁶ was always of the view (*belief* would be a better word because in spite of all his efforts he never produced any satisfactory underpinning for his ideas⁷) that the structure of science was based on the shifting sands of the current acceptability (on the prevailing evidence) of an explanation. New evidence, both observational and the outcome of mental activity, could at any moment render the conventional view no longer acceptable. Hypotheses he implied exist to be disproved. A modified but less uncompromising version of this is: by all means accept and work within conventional science; retain scepticism so that when its conclusions are at odds with underlying theory; but do not be uncompromising; rather be prepared to shift ground. I have been a very imperfect practitioner of this view because surgeons are a band of organised optimists for whom belief in success against the odds has been part of their *credo*.

The scepticism of the hypothetico-deductive approach that I have outlined does not lie well with the clinical need of doctors to encourage themselves and those they treat and I have frequently encouraged beliefs in myself, my team and my patients which do not withstand rigorous and dispassionate analysis. When, however, it is possible to stick with the procedure of hypothesis testing followed by either rejection or tentative acceptance, we follow a pragmatism which is a sound basis for the clinical evaluation of difficult problems. I have, as an aside, to say that surgeons are sometimes better at this than physicians although this does not stop the latter from often feeling that they should dominate any decision that is reached about an individual patient.

A matter that follows, and which is in some ways at odds with the Popperian approach to scientific thinking about hypotheses, laws or theories, is the device that underpins much of our practical approach to dealing with patients—

induction. We use generalisation, a form of induction, to apply the results of prospective randomised clinical trials to the management of patients who did not take part in the trials and also Bayesian-based induction to make, for example, a diagnosis of the cause of abdominal pain in the next individual patient who presents to us.⁸ Such methods *work* though not necessarily with precision—and perhaps by definition they are fallible—and this is the most powerful argument in their favour. Yet it was in the city that is home for Proceedings that David Hume pointed out⁹ some of the shortcomings of the inductive approach—chiefly that it transgresses the more rigid canons of *deduction*. Hume's arguments still seem to bedevil philosophers of science; Popper never came to terms with the matter so that much of his often repetitive and churlish later writing was marred. I cannot go into the details here—even were I appropriately qualified to do so—but merely say that though I understand the thrust of Hume's argument, at least in its simplest form, one of my beliefs is that it is possible to live with the uncertainty it introduces into our thinking as a fact of life. Poincaré provides support by remarking that 'if ... (probability) calculus be condemned (and I would remind readers that such a calculus is at the heart of inductive inference), then the whole of the sciences must also be condemned.'¹⁰ Professional philosophers will throw up their hands in horror at my superficial amateur approach which involves looking in opposite directions at the same time but it is to me the only way of believing both in the provisional nature of scientific knowledge and the utility of inductive inference.

Although I am Janus-like about accepting both lines of reasoning, I have the additional belief that we must be careful about the extent to which we generalise and exalt results so that they assume the status of scientific truth. I have developed this argument in more detail elsewhere¹¹ and regard it as a necessary brake on the use of controlled trials in altering our practice of medicine. The argument is a little convoluted but can be roughly outlined by saying (as R. A. Fisher anticipated in agronomy¹²) that each trial should be regarded as an experiment which yields certain results which can be manipulated and summarised in statistical terms to give rise to certain conclusions. It is a further intellectual, and not necessarily scientific, leap to carry the generalisation beyond this. I am alarmed by the willingness with which that jump is made in clinical work and am equally suspicious of *meta-analysis* which is a further extension of the same practice. Evidence Based Medicine¹³ (which we had all believed, along with Moliere's *Msieu Jordaine* in another context,¹⁴ we had been practising all our lives) should be only partially based on such generalisation which must be cautious. In addition it rests on the scientific credibility of the mechanisms which are invoked to explain why some things work and others do not.

What I have written in the previous paragraphs contains another implicit belief which has made me somewhat heterodox in my professional life. Most of those who practice and teach clinical medicine pay some lip service to the concepts of philosophy and logic being an important and integral part of professional thinking. Few however carry this deeply into their practice, whether this be at the bed-side or in the committee room. I believe that clinicians should pay much more attention to the logico-philosophical foundations on which their practice is based. Again I do not enter here into detail but rigorous thinking, an understanding of even the elementary features of symbolic logic and of probability theory could so often dissolve foolish disputes in clinical medicine if

we were more prepared to use them. However I have learnt (I was going to say 'to my cost' but that would be too self-pitying) that logic plays but a small part in the practice of medicine and were I to train again I would wish to have more instruction on how to blend logic, self-insight and the manipulative art of influencing other people by non-logical methods. It grieves me to see how little of interest in philosophy and logic seems to show itself in today's young clinical scientists. The matter is of additional importance in that statistical methods play an increasingly important part in modern experiment, and problems of generalisation are central to and controversial in the interpretation of statistical analysis.

I must, if I am to follow what I assume to be my brief, give some consideration to beliefs in what I lump under the term human values. My generation and many before it were implicitly brought up with belief in and respect for human life and for the individual though if, as a new graduate, I had been asked to articulate this, I would have found it very difficult to do or to quote the sources from which my value system had been acquired. Was it some form of social or parental osmosis? It certainly was not from any deep reading in what used in Scotland to be called Moral Philosophy.

At least two things follow. Many of us (and I write as the VJ day commemorations are reminding us of what was happening fifty years ago) have had difficulty in understanding man's continued inhumanity to man. Yet my own experiences in the Far East in the late sixties have forced me to the view that it is the exception to find that the human race is good. There is a long and complex argument here on the matter of sin and redemption, but I believe that it is right to adopt the negative stance that man is bad though whether there is the possibility of perfection,¹⁵ only the slow if inexorable march of natural selection—perhaps modified by the feedback from humans themselves—will establish. Evil is seen in its most stark forms in war and genocide but I do not think it is over-stretching the argument to say that self interest, self advancement and a thoroughly subjective view of priorities are examples of the same thing. During my years as a Professor I came to believe that for the most part the same behavioural malevolence was apparent in peace-time professional activities. Idealists and realists have a certain amount of common ground but it is rarely shared by groups of academics who tend to fall out if their own personal patch is threatened and to react by self-protection, even although this is not in the interests of the organisation in which they work. I carry my scepticism through to my conclusions about the motivations of human behaviour about which I tend to take a jaundiced rather than a rosy view. I should make it clear that one should try to keep to the sceptical side of the line that separates scepticism from cynicism but that is sometimes hard to do.

I think I can also say without being too sanctimonious that my generation was inculcated to believe that we had to try as hard as we could for the Benthamite ideal of the greatest happiness for the greatest number—but according to our lights. The qualifying last phrase is important because (and physicians may say that this is less the case for them than for surgeons) the grounds on which trying hard is based may be false or based on inadequate reasoning and there is nothing worse than someone doing their utmost when they are wrong. However I still believe in the concept although I realise there are all sorts of (specious?) qualifying arguments about partitioning personal energies in other directions such as family, sport, hobbies and entertainment. I take the drift of

these but still regard the pursuit of our profession, whether it be in the ward, the clinic or the laboratory, as the over-ridingly important matter. This is the Protestant ethic of Max Weber¹⁶ now somewhat unfashionable but from which the *work* ethic which perfuses modern society is largely derived. I prefer the concept of *work* because to me the Protestant view—at least as promulgated by its more Calvinist exponents—embodies too much of a killjoy approach that pleasure is sinful. Also in the form outlined by Weber it had implications for the political and economic structure of society to which I would not subscribe. I do not have these as part of a system of beliefs.

From the work ethic can be derived another important belief necessary for the surgeon but best expressed in the words of Abraham Lincoln:¹⁸

I do the very best I can and I mean to keep on doing it until the end. If the end brings me out all right, what is said against me will not amount to anything, and if the end brings me out all wrong, ten angels swearing I was right will make no difference.

I have indicated my scepticism about the goodness of human beings (including of course myself) but in spite of using this belief as the mainspring which drives the clockwork of my behaviour, I also believe that we must always be in the debt of others and, especially—although not exclusively—in the scientific life, acknowledge this. Newton's phrase about being able to see further because he stood on the shoulders of giants loses none of its force from overuse. I grieve at our almost uniform inability in acknowledgement (of which I have often been guilty myself) and I regard (that is believe) one of the most important purposes of history is to ensure such recognition. The cynic in me says 'but there is ample evidence that history can be rewritten at the drop of the hat of political expediency' but I also believe that 'truth will come to light ...'¹⁹ even although it may not do so in time for us to see it. Perhaps I exaggerate the anhistoric sense of the modern world and I am now, as I have time to look back and reflect, more conscious of the need to understand my debt to others; the next generation, who currently seem slow to acknowledge this, may merely reflect the attitude in my youth of frequenting doctor and saint without realising that they were the source of what little I became capable of thereafter. This view is more in tune with a Popperian approach and perhaps someone in the years to come will test the hypothesis.

Earlier I mentioned that clinical scientists do not have much recognition in the scientific community unless they become 'proper' scientists by embracing a reductionist approach. I believe that there should not be a hierarchy of sciences which makes mathematics or particle physics or astronomy more significant than medical biology or reasoned clinical practice. We all bring to our work a sense of analytic thinking and it is as much an intellectual exercise to tackle the problems of belly ache as to work on the human genome. Failure to recognise this and the desire of individuals to rise in the perceived hierarchy of recognition has been one source of the inability of clinicians to achieve an appropriate status in their own right unless they can, as a few *have* done, merge into what is regarded as the scientific mainstream of their day. We have only ourselves to blame in that what we kow-tow to are regarded as more fundamental sciences which, although they are enormously important, do not necessarily contribute to solving the day to day matters with which we are concerned. I believe that there should be an end to such hierarchies but I doubt whether this can be achieved.

Last, and although I may be the poorest exponent of it, I believe in

scholarship. The Oxford English Dictionary tells me that this means 'learning, erudition'. For me it has a slightly more specialised meaning, an intellectual and sometimes highly charged (compelling) interest in what goes on around one. One of my friends from my days as a research fellow put it nicely when, on being asked his interests, said '... fairly wide—anything from old boots to atomic energy'. I think it was Whitehead²⁰ who remarked with more precision though less colour that 'disinterested intellectual curiosity is the life blood of civilisation' and that is a belief to which I fully subscribe. I do not necessarily equate this with science though there is a considerable contribution from that field. However, to adapt a phrase from Hume,⁹ such curiosity is part of the 'cement of human perception of the universe'. It has, of necessity, its limits in that more often than not I personally have to say, 'Yes, of course I am interested but I do not understand'—a phenomenon doubtless associated with age. I believe however that it is a concept that one should carry into advancing years as a method of staying off the Shakespearian state of '... lean and slippered pantaloons' which has led me vainly to attempt to be '... full of wise saws and modern instances'.²¹ And that is perhaps the appropriate note on which to end this disjointed account by an intellectual peripatetic on the fringes of clinical science.

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- ² Steiner R. Has truth a future? The Bronowski Memorial Lecture Listener. 1978; **99**: 42–6.
- ³ Kuhn T. The Structure of Scientific Revolutions. Chicago: Chicago University Press 1962. The importance of this work seems to be fading (and we have recently been reminded that, as is so often the case, the ideas it contains were anticipated—see *Lancet* 1995; **346**: 1094) but I still feel that it is an important way for scientists to examine themselves and ponder the question posed by W. H. Auden in his 'Its no use raising a shout':
 'Here am I, here are you:
 But what does it mean what are
 we going to do?'
- ⁴ The phrase is of course from J. K. Galbraith's *Affluent Society*.
- ⁵ My teacher Francis Moore (formerly Moseley Professor of Surgery at Harvard and the Peter Bent Brigham Hospital, Boston, Mass) coined the term *Surgical Biology* to define the scientific activities of surgical clinical scientists and I have adapted it to describe overall clinical scientific research and scientifically based practice. For the development of the concept readers can refer to his recent work—*A Miracle and a Privilege*. Washington DC: Joseph Henry Press 1994.
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- ⁷ See for example: Stove D. *Popper and after: Four Modern Irrationalists*. Oxford: Pergamon Press 1982.
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- ¹⁴ Moliere (1671) *Le Bourgeois Gentilhomme*.
- ¹⁵ See for example Passmore J. *The Perfectability of Man*. London: Duckworth 1970. This is a lucid account of the chequered history of a concept that most of us, at least when young, took for granted.
- ¹⁶ Weber M. *The Protestant Ethic and the Spirit of Capitalism*. London: George Allen and Unwin 1965.
- ¹⁷ I got this quotation from the late James Learmonth's commonplace book which he kindly lent me. I have not been able to trace its origin perhaps because I have not tried hard enough to do the best I can.
- ¹⁸ Shakespeare W. *The Merchant of Venice*, act 2, sc 2—though there are earlier references for what is, itself, a fundamental truth.
- ¹⁹ If I am right this was in *The Adventure of Ideas* but my copy of this extremely difficult book, which I almost completely failed to understand, has disappeared—probably as a result of what my father described as 'the number of books that I have acquired through borrowing is only equalled by the number I have lost through lending'.
- ²⁰ Readers will realise that I have transposed the quotations from *As You Like It* to suit my own purposes.