Why Machines Need People

The John Fry Memorial Lecture

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Professor Lloyd, Mrs Fry, friends, colleagues, distinguished visitors. I cannot tell you how honoured I am to be asked to give this lecture. Or how grateful I am for the opportunity to try to express, however inadequately, the deep promptings of my heart which have preoccupied me from my earliest days in general practice.

As someone who naturally reveres heroes, it is particularly daunting for me to find myself speaking, at the end of my career, in honour of a man who was a legendary figure who loomed over general practice when I started out. I want to approach my main subject by asking what drove this man to make such an enormous personal impact, and what aspects of the environment at the time made it possible? For it seems clear to me that this environment has now changed. And changed more radically than we commonly realise.

The cause for this change has undoubtedly been our infatuation with technical progress. The effect has been to make the world in which we live, and for the present discussion, the world in which GPs now practice, more and more like a machine. I am going to ask why the advantages of this new way of doing things are so blindingly obvious, while the disadvantages, although widely sensed, seem so curiously hard to define, and so impossible to prove.

I think there are good reasons for this curious asymmetry, and that those reasons are intimately linked with my final conclusion.

John Fry was born Jacob Freitag in East Poland, in 1922, of Jewish descent, and his parents brought him to England to escape the Nazis at the age of seven. His subsequent struggle to make his mark in his adopted country, against

prejudice and social exclusion, surely accounts for some of his motivation. He was also, clearly, a product of those post-war times. He was one of a generation of extraordinary people, one of whom, John Horder, we are honoured to have with us tonight. All of them were driven by an internal, instinctive sense of duty, accompanied by a rock-solid personal integrity.

Those formative years of modern British general practice are often referred to today as 'a mythical *Golden Age*'. It is easy to say that, and understandable; nobody wants to think that progress is going the wrong way. But the fact is that it *was* a golden age, and that something changed to end it. We used to refer to that change as 'when the darkness came', and everybody knew exactly what we meant.

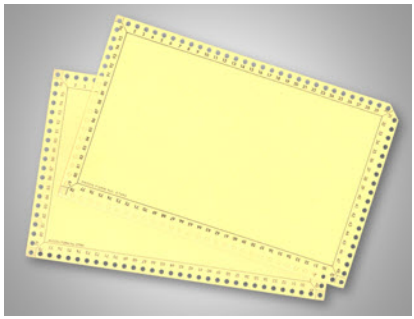
Bliss it was in that dawn to be alive...

But let us return to that dawn, to those post-war years, to that time of revolution. New ideas, new technologies, new structures of society. It was an age when everything seemed possible, when there was so much to do, when so much in the world was a wilderness, ripe for the taming. It was a time when ordinary people, not just *extra*ordinary people like John Fry, felt they were important, because they could make a difference. And *that*, combined with the responsibility a GP feels to the patient sitting opposite him in surgery, was the best motivation in the world.

The great tide of revolutionary energy thus unleashed in British general practice divided itself into two streams, which you could call the 'human' and the 'technical'. And while we must remember Fry's rich humanity with his devotion to his patients, his playing rugby for Beckenham, his local team, his family life; his great contribution in medicine was to the other : the drawing back of the curtains on traditional general practice and the letting in of the light of science.

Having failed to achieve his ambition to be a surgeon in spite of his Fellowship of the Royal College of Surgeons, John Fry followed his father into General Practice, and there he set about his meticulous record-keeping, taught to him by his father and inspired by the example of James Mackenzie. Thus Fry built up his vast

collection of data, recording the natural history of the diseases he witnessed amongst his huge personal list of up to 5,000 patients. (This was at least 500 more than he was allowed to be paid for).



Edge-punched cards

Using an ingenious system of his own devising, he punched his observations into the edges of Cope-Chat filing cards. These he subsequently analysed by the simple but powerful expedient of passing a knitting needle through the holes in each stack and lifting the unpunched cards away. Thus he accumulated the unassailable body of epidemiological data which became the raw material for his sixty books, his innumerable scientific papers, and which formed the basis of his unique international reputation, his membership of some sixty committees, his appointment as adviser in general practice to the British Army, to the World Health Organisation, and so on.

So he was a man who took the tide of opportunity at the flood. "Bliss it was in that dawn to be alive. . .

...but to be young was very heaven".

I was a member of that luckiest generation which inherited all this excitement and opportunity, but had escaped the war. I was passionately committed to the ideals of the National Health Service, as I still am, and from the moment I first saw general practice it electrified me with the warmth of its humanity. So from the beginning it was that other stream, the human stream, that drew me to general practice. I sensed at once that here was a different kind of thing entirely from the shiny, stainless-steel world of technical medicine that I was seeing in hospital.

Every GP I met seemed to love his work, and a crucial factor for me was the freedom and independence that the environment seemed to offer. Provided you took care not to get stuck in a large, dynastic practice, it was almost entirely non-hierarchical; GPs

bossed nobody, and nobody bossed them, and that suited me just fine.

General practice medicine was also *inclusive* whereas specialist medicine was *exclusive*. 'Holistic' before the word had been invented. And this suited me too; I wanted to be a 'generalist' before that word was invented. It is quite common today, but I was one of the first to start using it.

So, I joined in the great project of modernising our practices. And there was much to be done: when Fry wrote his MD thesis on common respiratory diseases in 1954 he had already had his age/sex register card index of his patients for 5 years . The practice I entered in 1970 still had no list of its patients of any kind, nothing but the Lloyd-George record envelopes on their shelves. One of the first jobs was to take these home in batches so that my wife and I could spend the evenings of our love's young dream writing out age/sex register cards by hand.

When I moved practices eighteen months later we did it again.

At the same time, as part of getting to know each patient the first time I saw them in surgery, I was putting the notes and letters in order and writing summary cards at the front. I did all this twice as well.

This is the sort of thing I mean when I say we did more in those days than any administrator would ever dare to try to impose. And all the time we felt we were doing the best job in the world.

A typical set of sorted Lloyd-George note-cards

Glittering prizes

Now, I wouldn't be here tonight if I hadn't made something of a mark with my medical writing, and one of my prized possessions is the George Abercrombie Medal, given to me four years ago by the Royal College of GPs for distinguished

services to general practice literature.

A patient being started on the Health Screen questionnaire by Sister Dorothy Kerrison

But long before, back in 1989, I won the John Perry Prize of the Primary Care Specialist Group of the British Computer Society, which is still billed as 'the most prestigious prize in primary care computing'. This was for a self-administered computer health-screening questionnaire, which I designed and programmed myself in Basic. It ran on Alan Sugar's good-old Amstrad PCW, and it came to be used by a number of practices around the country and one in Pakistan. I did it because a patient had shown me the printout of a health-screening questionnaire that he had been given by his employer in Portsmouth, and I thought I could do better.

Now – in order to establish my qualifications to talk about the interface between science and the humanities, between *machines* and *people*, indeed, it occurred to me that it would be rather nice to be able to claim tonight that I am the only person in the whole wide world who has ever won both of these prizes.

But unfortunately I can't:

When I contacted both organisations for complete lists of their previous winners, the Royal College of GPs sent me theirs by return of email. But the British Computer Society, after much hunting in their (presumably paperless) office, were unable to find any record of winners prior to 2003. They assure me they are still hunting, but they hold out little hope of success.

So the evidence-base for my proud boast - to show just how firmly I have a foot planted in each of C P Snow's '*Two Cultures*[1]' - is entirely lacking. But there is, nonetheless, a silver lining to this cloud, which might actually enable me to rest my case and startle the caterers by sitting straight down:

[1] Snow (1959)

It is not just that the British Computer Society is the sort of organisation that you might expect to be good at handling data; but the employer in Portsmouth who provided my patient with the primitive questionnaire which stimulated my winning project all those years ago was IBM. And as IBM was the largest computer firm in the world at the time, you might have thought it would be the sort of organisation which would be good at writing programs. *Machines need people* – Q.E.D.

1984

The approach of the year 1984 had stimulated a spate of speculation over the extent to which we were, or were not, approaching the famous dystopia imagined by George Orwell. The BBC ran a special programme that New Year's Eve, and it was as I sat watching it with my colleague Christopher Everett that I decided to begin a study of my own.

I saw that the application of computers to general practice, in which I felt myself to be a pioneer, provided a wonderful opportunity to study the rapidly-developing interaction between humanity and technology. GPs' privileged experience of humanity at its most personal and intimate level combined with their experience in an advanced technical discipline, gave them a *uniquely balanced view*. More than this, I could see that *inclusivity* and *generalism* was a much better model of life than the *specialism* that the world tended to assume enjoyed a more authoritative perspective.

So I began collecting material. I concentrated on little things in my daily experience that struck me as *surprising*. Edward de Bono's books had taught me that surprise is an infallible signal that something you have observed is new and significant. It means that your subconscious mind has done its automatic job of spotting something which is incongruous with your internal model of the world. So instead of rejecting odd things that I noticed, I started to write them down.

My computer, acting now as a word processor, was the tool which made this possible. It made me, and my generation, the very first people in the whole of human history who could make records in a form which is at the same time ***fixed*** and ***flexible***. (Blackboards

and writing in the sand are not the same at all) So I was able to mould my ideas like clay, come back to them after an interval, correct things that still seemed wrong, and mould them again. Men have always sought means to record, but this was an entirely new world.

And not only that, at the same time this 'artificial brain' I was using provided me with a second thing which was equally new – a fabulously instructive ***analogy*** for the workings of the human mind.

From this simple beginning, and with Christopher's relentless encouragement, my project grew, and in 1995, eleven years later, I had moulded it into the book, of which I am still immensely proud, *The Paradox of Progress*.

The thing that gave me the courage to approach Gillian Nineham, at Radcliffe Medical, with a hard sell, was the success of the session I had run the year before at the Royal College of GPs *1994 Spring Meeting* in Portsmouth.

That was the first time I used the title *The Paradox of Progress*, and I added the subtitle, *An exploration of the problem of retaining respect for human values in an increasingly systematised world*. Something struck a chord, and the room was packed. I will never forget the audience, including many of the most senior and revered figures in the college, rising to their feet to applaud as one of my speakers, a retired headmaster, Alan Pattison, finished with these words:

> *"Teaching is very much a matter of having enough freedom, within a reasonable structure, to exercise gifts and judgement: Surely that is what you as GPs must retain: the freedom to exercise personal judgement and to relate to each patient in a personal way."*

The Paradox in a nutshell

I only organised and chaired that session but afterwards people clustered round to tell me how important it was. Several of them told me to, 'Keep the flame alive'.

And believe me I have tried. But things have not got better, they have got much, much worse.

Just as quickly, that is, as things have got much, much better.

That's the paradox in a nutshell.

The systematisation of our society, and specifically the external control imposed on professional people, has reached a point where it is the stuff of conversations on street corners, in supermarket check-out queues, and at 90th birthday party celebrations like the one we attended on Sunday (of which more at the end).

- The madness of *sell-by dates*.
- The stupidity of *targets*.
- The corrosive effect that perpetual visits by bossy inspectors has on head teachers, on wonderful care-home managers, on practice staff.
- The inspirational drama teacher at the College where I was once a governor telling me how 'the most reasonable colleagues become monsters immediately they are promoted into management'.
- The extraordinary blindness of 'the system' to the fact that ***continuity of care*** is the most indispensable ingredient *of all* in looking after dependent people at home. And that you can't replace that by parachuting in a new tier of highly paid organisers and calling them matrons.

And just don't start me on bureaucracy, Health and Safety, paperwork, risk-aversion, obsessional sunlight-avoidance in school-children. . .

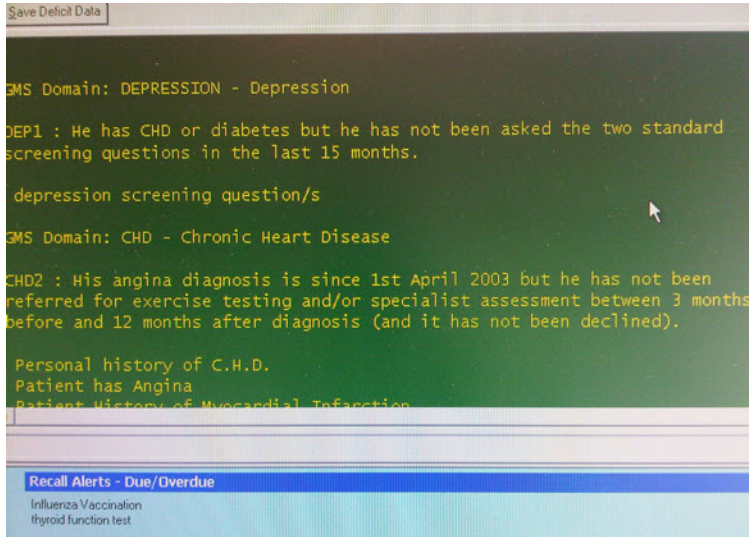
While this sort of 'madness' is constantly ridiculed by comedians the truth is that the reality is beyond parody, and certainly beyond a joke. At a time when mankind should have been being uniquely empowered by technology, technology has enslaved us to an extent which John Fry and his contemporaries could simply not have imagined possible. Although there can be no doubt that it is the logical extension, *reductio ad absurdum* in fact, of the

"The whole process has become stifled with bureaucracy"

Beyond a joke

approach which he more than anyone else set in motion, and for the best possible reasons.

What would he have thought of the first moments of a consultation with a patient who has been plucking up courage to bring the one problem which is worrying them more than anything else to the one person they trust to help them, being dominated by a warning label on the computer screen flashing up to tell the GP that he (or she) hasn't done one or even several *Quality Outcomes Framework* checks and that the practice is going to lose a little money.



What would John Fry have made of that?

Good question. He might well have approved. Because there is another side to it which we can all see as well. Another part of us is drawn to the efficiency of this way of doing things, to the obvious good being done on the population scale. He would almost certainly have loved the wonderful facility with which statistics can now be collected and analysed. Or would he?

One of my reasons for getting involved in the computerisation of general practice was that I could see the danger that computers could easily be used to fix one particular model of general practice 'in tablets of silicone'. So the *humanity* which had always been, for me, the defining characteristic, would be driven out and possibly lost for ever. I wanted to try to balance the influence of people who I could see were just as enthusiastic about computers as I was, but who were interested in using them in an utterly different way. They saw them, and there were many at the Royal College of GPs at the time who took this view, as agents by means of which the status of general practice could be raised, by making it a more of a proper scientific discipline, more, in fact, like specialist medicine. And here at last was a solution to the administrators' historic bugbear of GP's *independence*. These people had no interest in doctors using computers as owner-drivers as I used them, they saw computers, and information technology in general, as the heaven-sent answer to a central-controller's prayer.

I tried to protest that general practice was different, that it had to be proud of its way of doing things, that the College should be championing our unique approach to life, that we should stand firm together on our principles. I said, in a phrase which has resonated in my mind ever since, general practice is being forced to define itself in terms which deny its very nature.

And so, instead of being at the cutting edge of developments in the branch of medicine for which I started as such an evangelist, I found myself cast more and more in the role of maverick.

The invisible hand (on the scales)

But there is still this odd phenomenon, which is what I am trying to talk about this evening: I found then, as I find now, that almost everybody agreed to some extent with my point

of view. But this didn't stop them tipping, on balance, for the diametrically opposite one. It was as if an invisible hand was pressing down on one side of the scales.

So tonight I am addressing a meta-problem: Before we can 'treat' the madness which is afflicting our society in the midst of all the progress, we have to try to understand the nature of this 'invisible hand.' And we can't do that in the clear terms I would love to employ – you can't set it out in a formula, or a set of bullet points.

Like a timid animal, it moves away as soon as you look at it.

The more clearly you define one aspect of what you want to say, the more all the associated aspects, upon which the idea was totally dependent a few moments before when it was alive and central in your mind, evaporate into the air.

Or like Orpheus leading Eurydice out of Hades: when he couldn't resist turning to look at her, she turned to stone.

I think the idea that I am trying to talk about at the moment is rather like that, and that that is the meta-problem.

I am experiencing this phenomenon as I write these words with only a few days to go, trying for the umpteenth time to find a way of pinning-down what I am trying to say.

My wife makes a suggestion: she says I should do what we did last year when we were writing our celebration of Charles Darwin's anniversary together for our little drama group – decide what you want to say and then just cut out everything else until you have a clear narrative. (Hidden subtext: For goodness sake get the thing finished and safely backed up on one of those memory thingies). But I reply that what I am trying to say this time is precisely that if you do that you lose the essence of what you are trying to say.

This is why none of the arguments we have to use achieves any purchase; none of them cracks the carapace of certainty with which the technical part of our mind conceives the world:

> *"General practice is being forced to express itself in terms which deny its very nature"*

Oh yes, that's neat, just tell me exactly what you mean. . .

I am always suspicious of sentences that have the word 'just' in them: "Just pop round, Doctor". . .

Models of the way we model ideas...

My empirical studies, which I have referred to as my project, were all very much concerned with deducing what ideas in our minds are like. I drew on a wide range of sources, some of which I have listed elsewhere, but I would like to acknowledge the crucial influence of Iona Heath and especially her William Pickles Lecture, *Uncertain Clarity*[1]. But having said that, basically I worked the thing out for myself. The uncanny way it meshes with what people approaching from quite different directions have also deduced (of which more in a moment) gives me some confidence that my amateur speculations may not have been all that far from the mark. Here is what I said in 1994:

> *In our minds all the different things we do are in one sense separate and in another sense make-up one 'whole'. Every single thing in our minds merges into this mysterious continuum. This enables our minds to perform a feat which would be an impossible dream for the designers of computers who are restricted to finite units of information. Our minds express everything relative to everything else. Almost any pair of concepts, however ridiculously dissimilar, are scrutinised automatically and common features found. Incredibly, these common features are then used for a mutual enhancement of both the original concepts. This mechanism is exactly what is needed to simplify the task of handling the real world. Everything is dealt with by analogy.*
>
> *Even when we approach a new task for the first time we begin with a complete set of behaviour patterns which our mind has selected as being most nearly like what it expects the new task to be. This match is often extremely good and even if it isn't the mind instantly begins to im-*

[1] Heath, I, (1999)

prove it in the light of experience, using other existing patterns as it does so.

Thus practically any skill, and any knowledge is relevant to practically anything else.

The fact that we cannot understand how this happens, that we cannot understand how it could happen, that we couldn't begin to make a machine to imitate it happening, doesn't alter the fact that it does happen. All you have to do to prove that it happens is to notice it doing so[1].

Since writing that, this image of ideas suspended in the mind in a kind of shimmering coexistence has been reinforced and refined. I copied much of the material of my project into a special program which is supposed to simulate the structure of the mind and allows you to link individual items, as freely as you like, in virtual space. At this moment it tells me that my 'Personal Brain[2]' as it is called, contains exactly 6,427 of these 'thoughts' with 11,400 connections between them, 2,063 notes, and 2,164 file attachments. But even though this simulation has some of the features I am trying to understand, and gives you some idea of the complexity of the idea I am trying to convey tonight, what really impresses you is that *it isn't like the human mind at all*. For one thing, when did you last count up the number of thoughts in your mind?

So one of my empirical conclusions has been that the human mind maintains the internal model of the world on which we base our actions, not in digital form, but in the form of *analogy*. 'Pictures', if you like, but that is an entirely inadequate analogy itself. It's much cleverer than that. Because another of my conclusions is that when you get down to the fine structure of life, for example to individual human interactions of a GP in surgery, reality consists of *many incompatible truths*. The world is not a simultaneous equation and it doesn't have one answer. And our minds are exquisitely adapted to handle that as well.

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[1] Willis, J. (1995) pp.94-5

[2] www.thebrain.com

Meanwhile we have hidden *failings*: our inescapable propensity is always to seize and lock onto absolutes even when the reality of the situation is obviously relative – best-before dates, rank orders, winners and losers, champions and runners up, goodies and baddies, guilty and not-guilty. Time and again our common sense is overridden as soon as the 'answer' is stated in digital terms; and the situation is compounded by the law courts taking exactly the same line. The more elevated the viewpoint, the less we are able to cope with *nuance*.

The binary view leads directly to the kind of collective obsessional neurosis - risk aversion - which we all recognise, but find it so hard to oppose. John Adams is convincing enough as you listen to him, or read his classic book *Risk* , but when it is your child riding towards the open road on their bicycle, we would all want to say, 'you can't be too careful'. You have to be in a different mode entirely to say, with Adams, the only thing which avoids the world grinding to a halt: ' Actually, you *can* be too careful'.

Two different kinds *of models...*

So to summarise, the picture I was building up over the years of the way the world works was leading to a very odd conclusion. It was that there are two different ways of looking at the world, and they are completely incompatible. And one of these two ways is inherently dominant. But when I and others have tried to argue this, it was like trying to attack a panzer tank with a poem, or a song. Not just different things, but different kinds of things.

A further difficulty was that all this was happening at a time when there was a wholesale and worldwide retreat from rationality. I tried to argue at another meeting that what I called the whirlpool of scientific fundamentalism on one side was no more threatening than the sea monster on the other, with its two heads (like any respectable sea-monster) of anti-science and pseudoscience[1]. But that argument was pretty hard to define as well, and impinged not at all on the official mind.

So, as the panzer tank of technical progress rolled on, many people who felt like me became disillusioned, retired, or moved to

[1] Willis, J (2002)

the Celtic Fringes where they were still relatively free to be proper doctors. There was a general feeling of disappointment with what had happened to all our excitement and ideals. All that industry perverted, channelled, constrained into a complex, inhuman system – very efficient – in which individuals have lost, or been denied, that crucial feeling that they can make a difference.

But then came Iain McGilchrist's book, *The master and his emissary*[1], which I read, barely two months before being asked to give this lecture, with enormous excitement, because it provided the theoretical underpinning for what I had been inferring for so long.

This book provides compelling neurophysiological evidence that the two hemispheres of the brain are adapted to model the world in two entirely different ways, so different from one another that evolution has kept them almost entirely separate. Both models are necessary for us to operate successfully in the environment around us, but they are incompatible with each other.

These two different ways of conceiving reality map most beautifully onto the two conceptual streams I have been describing in the post-war history of general practice.

There is the broad, intuitive, emotional modelling of the right hemisphere which corresponds to the 'human' stream, and there is the focused, analysed, structured approach of the left hemisphere which corresponds to the 'technical' stream. McGilchrist's analysis shows, moreover, that the right hemisphere - the human side - is naturally the 'master', and the left hemisphere the 'emissary' - in other words the invaluable technical agent. See how this meshes with a paragraph from *The Paradox of Progress*:

> *So although it is in a sense easier to be a specialist, to choose one mountain and then climb it all the way to the top, the job of being a generalist, who gets to know a little of every mountain, is ultimately the more important one. Specialisation is a tool just as language is a tool. Both are immensely powerful and important tools which we should all use but they are not essential to life. The forming of a general, overall, self-consistent image of the world* is *essential to life.*

[1] McGilchrist, I (2009)

McGilchrist's message is that in modern times the emissary is usurping the master, as it has done in a series of cycles down the history of Western culture.

And part of the reason this has happened, to paraphrase disgracefully a massively argued and erudite book, is that while both sides are involved in everything, the relationship between them is fundamentally asymmetrical:

The right hemisphere is in direct contact with the outside world through the senses, but the left hemisphere grasps things (using the right hand), processes them, and fixes them in symbols, especially in language (the speech centre being, of course, in that hemisphere). And from that point onward there is no doubt about the outcome of any debate, because, to put it very crudely, the left hemisphere is the only one which can speak. So the processed, symbolic means of conceiving ideas is inherently dominant.

Iain McGilchrist emphasises that both hemispheres cooperate in everything we do. The vital thing is the relationship between them. There is a world of difference between the reality around us as originally perceived by the right hemisphere and the 'formal understanding' of it by the left. I quote:

> *'What is offered by the right hemisphere to the left hemisphere is offered back again and taken up into a synthesis involving both hemispheres.*[1] *'*

Even if this is only a metaphor, and it seems very much more than that, surely it is a marvellous model upon which to base a more enlightened relationship between the technical and the human streams of our culture.

The message

So let us make the message clear – we are not talking about one approach or the other. This is not a football match. We are allowed to support both sides in this game. I am not saying for one moment that we do not need these tools, that we do not need to try to prevent errors, raise standards, protect our children. What

[1] McGilchrist, I (2009) p.206

I am saying is that we must always take a broader view than at first sight seems desirable.

Our brains have evolved to model the world so that we can live and move in it effectively. But the full story of reality cannot be modelled simply, and we do it better by using two ways which are entirely different from each other. And the trouble is that one of these has become overwhelmingly dominant, and things like general practice can only be understood fully in terms of the other.

As John Fry said in his 1976 James Mackenzie Lecture,

> *'Working in general practice broadens the mind and humbles the soul. It is very different from the sheltered world of hospital practice*[1] *'*

It is that *breadth* and that *humility* that generalist doctors require today as much as they ever did. And it is that that makes them such a good example. They combine information from a myriad of sources to constantly maintain the internal model of the world on which they base their decisions. I have argued, and now re-state, that basing actions ultimately on professional understanding is *the defining characteristic* of the 'doctor' role. It is a natural role that has existed in all societies and it is not for doctors or their representatives to abdicate, nor for any politician to over-rule.

I left practice a little earlier than I intended because I had never once allowed my clinical priorities to be dictated and I could see that that was no longer tenable. I thought it was an important principle because I wanted to go on contributing to the debate. But do not try to tell me that nothing radical has changed since the days of John Fry.

Nor try to tell me that there is anything new in basing professional understanding on 'evidence'. The thing that is new is trying to make professional understanding subservient to evidence and to externally imposed rules.

That, and a simplistic interpretation of what constitutes 'evidence' having undermined doctors' confidence in the validity of their first-hand observations.

[1] Fry, J (1977)

John Fry says that the world of hospital practice, is 'sheltered'. That means that it does not have to cope with the complexity of life on the front-line. He referred many times in his writings to his role in protecting his patients from specialists.

Now that the principle has become established that front-line workers of all kinds are better controlled remotely from the centre, it is as though they are the focus of many searchlight beams. Each beam is directed by a different specialist who doesn't have to worry about the messy old 'everything else' of life. And just as everybody thinks it is all those other patients who 'waste the doctor's time', each of the searchlight operators believes, in all sincerity, that none of the other searchlights is really important.

Meanwhile each beam is unimpeachable in its logic, and any attempt to argue against it looks like ignorance and irresponsibility.

It is only at the focus of the beam that the madness appears.

Why Machines need People

If it became generally accepted that there are valid truths which are incapable of being expressed at all in scientific materialist terms, then we would be on the threshold of a new age of respect for the human mind and appreciation of its need for autonomy.

Ultimate clinical autonomy is a vital principle. If guidance is well designed (and we are a long way from that at the moment), a doctor may never deviate from it on a single occasion in a whole career. But the difference would still be *absolute*. *Guidance* is absolutely different from *rules*. Rules are for things like deciding which side of the road we drive on, but a doctor is only a doctor if he or she has taken responsibility along every step of the professional career.

If we are to motivate future generations of doctors to impose upon themselves the massive task of building and maintaining their understanding (because no administrator can ever compel or induce people to so Herculean a task) we have to create an environment in which they feel they can make a difference. And even become heroes.

And that means recognising the seductive force of left-brain thinking which continuously leads us to try to mechanise the world,

and learning to deliberately compensate for that 'invisible hand' upon the scales.

But the only agent we have, or are ever likely to have, for achieving that essential balance, is the educated human mind, operating in an environment which allows it to flourish.

Which means, as a bottom line, officialdom respecting the front-line view; backing off; and trusting professionals to get on with their job.

Here is a final quote from The Paradox of Progress:

"As we hunt around, more and more frantically, for ways to describe and control the world more and more perfectly, we find that the problems don't get less, they get more. Daily, we encounter the consequences of our failed perception. And all the time the answer we are seeking is there, not actually under our noses, but an inch or two above and behind our noses."

Oh yes. . .

I said I would mention the 90th birthday party that my wife and I were at three days ago.

After all the speeches, I found myself being beckoned back because the wonderful old lady, who used to be one of my patients, had one more thing to say. With tears in her eyes she told everyone that she would always remember how I had called in specially to see her husband on his 80th birthday.

Until that moment I had completely forgotten that one of the things I did with my first computer was to program it to alert me to my elderly patient's 'big' birthdays, so that I could sometimes 'pop in', however briefly, to congratulate them.

I can't help thinking that is a good way for people to use machines.

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James Willis' personal website, with the full text of The Paradox of Progress, plus details and texts of other lectures and writings is at: www.friendsinlowplaces.co.uk