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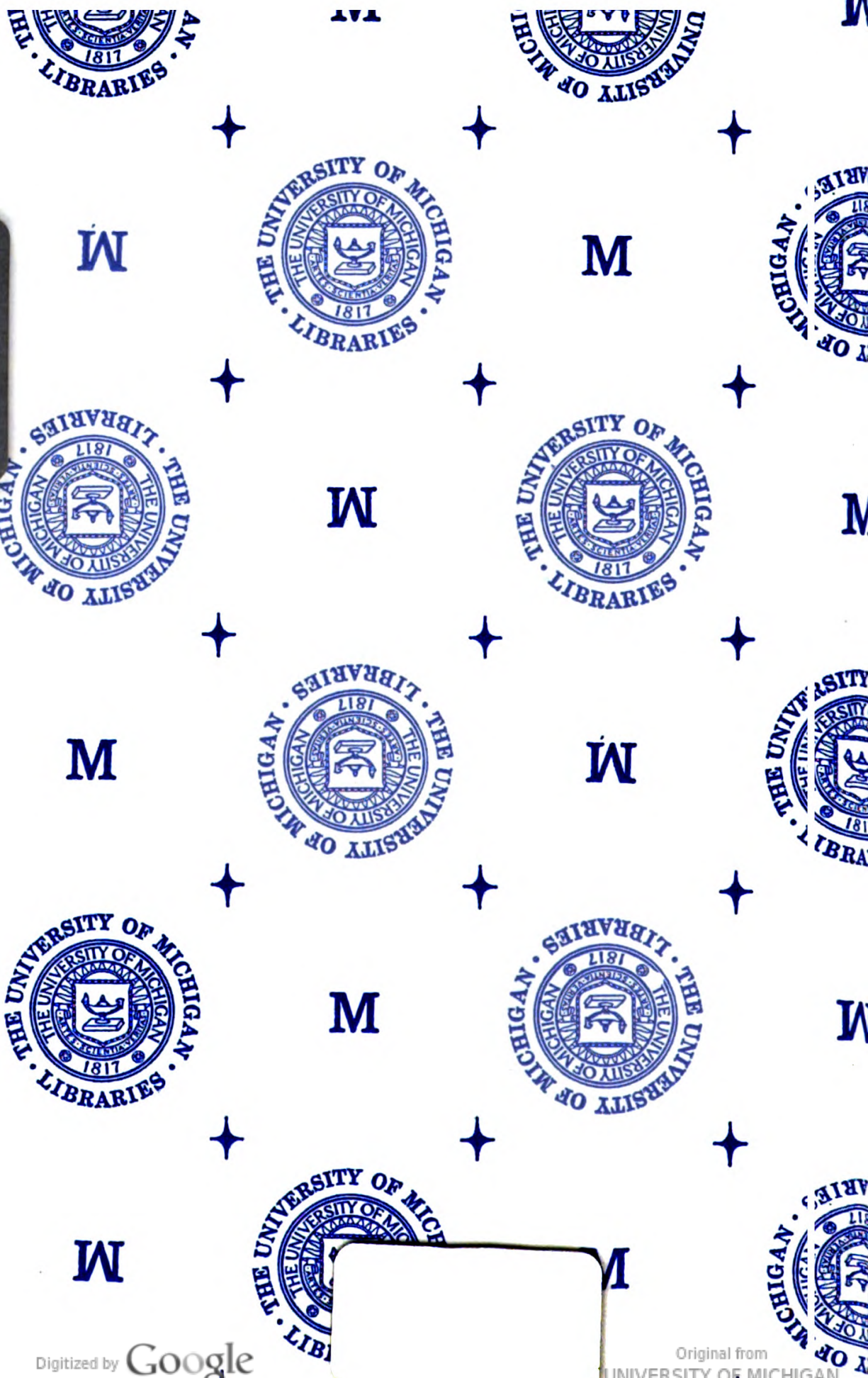
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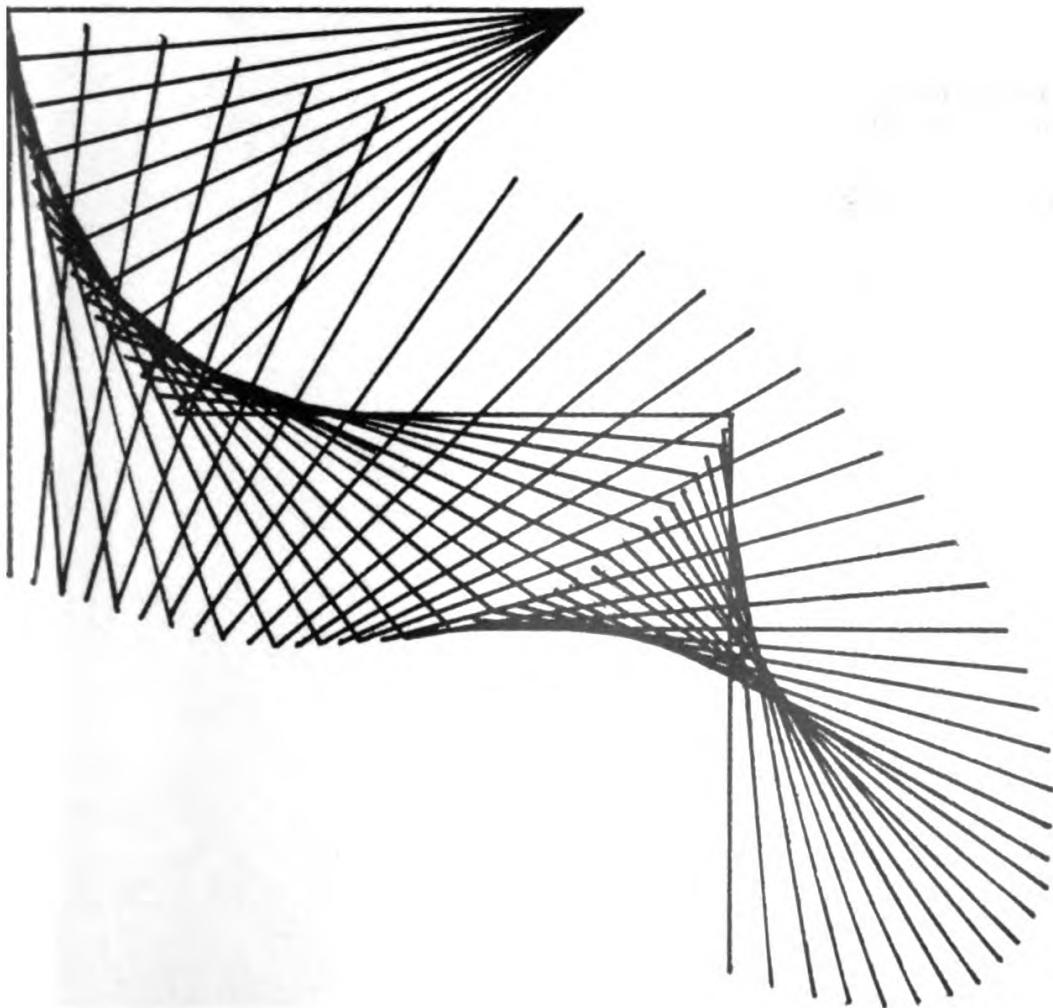


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THEORIA to theory

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Editorial

In this number we have a meditative piece by a poet, William Davis, on a book by another poet, Daniel Berrigan, who is an American Jesuit. Daniel Berrigan, like his brother Philip, also a Catholic priest, is in prison for pouring blood on draft cards and setting military draft files alight with napalm as a protest against the Vietnam war. (See our review article in *T. to T.*, V iii, July, which included Philip Berrigan's "Prison Journals of a Priest Revolutionary" in a group of books by different elements of the new radicalism in America.) These brothers are in the line of a long tradition of Christian conscientious objection; but whereas most conscientious objection has taken the form of refusing to do something publicly required, they have seen the power of making their protest through a public ritual action.

Discovery of the power of ritual is characteristic of the new radicals. The sit-in is a stylised form of behaviour, not just an unruly obstruction; so too are the marches and the rhythmic shoutings. More imaginatively, protests against the rituals of established society are being made through staging counter-rituals. These are rituals of rebellion, occasions for letting out frustrations, guying authority, showing what things look like when roles are reversed. Sometimes they are part of a political campaign. The bomb plantings of the Angry Brigade are more like ritual acts designed to shake people up (rather literally) than like acts of political assassination. They are, however, a dangerous kind of ritual act which can get out of hand. The bombs are too big. Most of us probably started out by feeling nothing but indignation against the Angry Brigade. But reading the account of the recent trial of Jack Prescott and Ian Purdie, on the charge of planting a bomb at the house of the Secretary for Employment, made us see that there was at least a moral problem here. When people get a desperate feeling that those at the top of society are not listening, they may turn to violent acts as a symbolic way of calling attention to what they want to say. (The bombings and shootings of the I.R.A. are not meant as symbolic acts, as ritual protests; they are meant as realistic acts of war.) Moreover, Jack Prescott had drifted along miserably as a criminal until he came across the Angry Brigade, where he found for the first time friendship, support and a purpose. Both he and Ian

Purdie were acquitted on the charge of actually planting the bomb at Mr. Carr's house, but Jack Prescott has been given 15 years for illegal conspiracy. "Conspiracy" is a very wide term. It may mean actual planning, or it may mean taking part in excited talk. This vagueness is important, since Philip Berrigan along with a number of his friends is facing further trial on a charge of alleged conspiracy to kidnap Henry Kissinger (Mr. Nixon's representative on Foreign Affairs) and to blow up the heating system under Government buildings in Washington. Again, we wonder whether, even if these actions were being discussed, they were not being thought of as possible ritual acts of protest rather than as attempts to hurt or kill. A kidnap to extort ransom, or accompanied by threats to kill, would not be a ritual act. If this kidnapping was being envisaged, would it have been like that? The line may be difficult to draw, and, as we have said, the ritual which uses dangerous stage properties may get out of hand. But the people who use violent rituals are not thugs. They repudiate the ordinary give and take morality of everyday social life, but they have something of the sacrificial morality of people following an absolute call. This is why it takes someone like a saint, and not just a liberally minded person, to reach them (Ian Purdie's mother, who seems to have been the one person who really cherished these young men and tried to win them from violence, may have been such a one). Even where ritual violence of protest turns to actual revolutionary violence, there may be a sacrificial spiritual elation, since people know they are just as likely – in fact more likely – to be killed as to kill. The trouble is that if they are successful they see their violence as justified and may go on using it fanatically and to oppress in turn.

If not only militant revolutionaries, but also to those who use violent rituals of protest, are not to slide into callousness, they will need to be people who have a contemplative side. Perhaps in the end these are the only people who can be trusted with such rituals. This is where the Berrigans are again important, and William Davis' piece shows this. (It also shows that not all "drop-outs" are following various kinds of Eastern religion. There are also Catholic ones, who use Christian imagery to express what they want to say.)

If violent rituals can get out of hand, non-violent ones can go the opposite way and become stereotyped. A crude social

psychology just sees ritual as stereotyped behaviour. There is indeed a ritual man in all of us. Erving Goffman (see for instance "The Presentation of Self in Every-day Life" and "Interaction Rituals") and Richard Hoggart, in his current Reith Lectures, describe how many of our social conventions and manners are in effect ritual games which we play with each other. Much of Goffman's material comes from studying people in asylums, but what we all do outside asylums is not so different. We meet ritual actions with other ritual actions, often in order to preserve our privacy from intrusions. The editor remembers an occasion when a High Church curate on being introduced to the then Bishop of Oxford, Thomas Strong, knelt down and kissed his ring. Strong was not used to this kind of behaviour, and he rejoined with "Nasty day it's been, hasn't it"? Remarks about the weather (in England, not in countries where it happens as expected) are ritual moves in small talk, where encounters can be mildly friendly without becoming "I-Thou". They can of course prevent more interesting communications from taking place. It is possible that the young man was hoping to establish a "father in God" relation with the Bishop.

Can ritual be used so that it is not a stereotypy or a defence, but provides a framework of communication within which something that matters can be conveyed? William Davis is so conscious of the stereotypy, the drag towards inertia, in nearly everything that we ordinarily do and say that he sees the alternative to tagging along as *silence* – silence as a condition of "being" in which we can rise above the inertia of time and the pressures to conform, and in which we can save ourselves from disintegration by finding unity with the source of life. He believes that if you are silent you may in the end come to know what you ought to do.

Silence can mean, among other things, getting to a state where we can really listen to each other. So it can feed forms of common life in which people do not feel pushed around, but can play their roles in ways in which their own characters count. Monasticism was originally designed to provide a framework in which silence fed into creative work, but Thomas Merton (our friend in T. to T. whose disciple William Davis is) saw that it was losing this genius. He was concerned with how there could be groups with this quality of life outside as well as inside monasticism. So too are many of the drop-outs.

They see our public ~~society~~ as a dying rather than a going concern, and they express their sense of the end of a civilization in a spirit of eschatology rather than of *fin-de-siècle*. (Daniel Berrigan's book and William Davis' meditation on it is about "Apocalypse.") *Fin-de-siècle* is a civilised attitude but a disillusioned one. These new eschatologists have vitality and are looking forward to something that may come. If meanwhile they are withdrawing into silence and forming groups outside the run of the world's work, this is not so unlike the flight to the Desert in the 5th century. Perhaps there must be people who do something like this in times when one world is dying and another is struggling to be born.

The drop-outs and radical protesters are people of great courage. They have succeeded as no one else has in shaking the assumption that what really matters is individually to get on in the world, and collectively to achieve economic growth. They can be overtaken by the pressures to conformity endemic in all groups, including their own. Or they may resist this. The future forms of social life may well depend on the possibility of there being groups which can combine the adaptable efficiency of the *kibbutzim* in Israel, which very well understand the value of good technology, with the concern for privacy and inner life and a chance "to do your own thing", which is what the drop-outs care about. Such a combination would have a double source of adaptability.

Which brings us back to the drag to conformity in social groups in general and in ritual in particular. Kathleen Russell (one of our contributors – see for instance T. to T. V. ii), who is a teacher of ballet, speaks of a "constrained spontaneity". This sounds a contradiction; she means that in ritual moves people can be so in rapport with one another that if anyone breaks out in an individual way, it does not disrupt, but the others meet it positively. Here a ritual can be the opposite of the obsessive way of maintaining defences that social psychologists say it is.

This creativeness can happen if a group can come to take its rituals, if not lightly, at any rate as a dispensable part of a wider enterprise, either of the group as a whole or of its members with each others' support. Contemplation – thinking (really thinking) – hard work – these can all count here, and some of the drop-out groups know it. Gandalf's Garden off the King's Road Chelsea features in a *de haut en bas* article

“Route Maps to Salvation” in the *Guardian* (December 4th). When you have kept a centre going on a shoe string as long as some of its members have, and when you have sat up at night as often as some of its members have with your neighbours who are trying to come off drugs, then you can criticize its “ear-ringed” young men.

* * * *

The “Theoria Association” (by whatever name it is eventually called) is beginning to be a kind of invisible college of collaborators in the background thinking needed for T. to T. We are looking for funds to give it more definite form.

The notes following this editorial indicate the possible religious implications of a more general project we are taking up, of looking at the criteria which can be used in trying to assess “way-out” research.

* * * *

Our cover was designed by Zette Barron. It represents a movement which starts in the top right hand corner; each “fan” moves at twice the rate of the previous one (shown by increase in size, so that the third “fan” is four times the size of the first). This way of generating curves to represent movements originated with the Eshkol School of Choreography (see *Biological Computer Laboratory Report* 10.0, University of Illinois). Zette Barron is an architectural model-maker, who is now bringing up a young family and is involved in teaching construction at a Midlands art workshop for children.

The Case for Way-out Research

*Dorothy Emmet, Margaret Masterman,
Ted Bastin, Robin Monro*

Recent press discussions of whether one should be a Christian or a humanist, and whether one needs to believe in God, seem to be shifting from being matters of philosophical argument to becoming matters of sociological fashion. Thus in an article in *The Times* Alistair Kee says that belief in God is a cultural matter (indeed that it goes along with a “flat earth syndrome” and that such believers as remain today suffer from “cultural schizophrenia”).

This line is developed further in his recent Penguin “The Way of Transcendence”, which has become a best seller. We are told the Death of God lasted from 1963 to 1967, not with the implication that since 1967 God has come to life again, but with the implication that to be interested is no longer in. How fashion-ridden can one be? Presumably we are to decide where we stand religiously not on what is true, but on what is congenial to think in the present cultural context.

This thesis is false. There is an alternative to being fashion-ridden. Granted, our thinking, our language, our forms of expression are deeply affected by current attitudes and social conditions. Nevertheless, there can be enquiry which is not merely congenial within a cultural context, but which is one people coming from different backgrounds can learn to appreciate as a way of making true discoveries. For *Science* is not just what people within a certain circle agree to say at any given time; if it were, they would not be able to use it to get to the moon, or cure diseases, or put up buildings that do not fall down. (That some do fall down underlines the fact that we take it for granted that most of them don't.) So we have this one example of a way of thinking which represents a gigantic, cumulative effort, however fragmentary and however faulty, to discover what the world is really like.

This of course is disputed by those who say that science also runs in sociologically conditioned fashions, the reference group for the fashion being what people doing science in a particular cultural context choose to say. Those who talk like this find

reinforcement in selective quotations from Kuhn's "Structure of Scientific Revolutions" (see Vernon Pratt's review of *Criticism and the Growth of Knowledge* later in this number) and from Michael Polanyi's *Personal Knowledge*. But to talk as though all fundamental scientific advance were thus fashion-ridden is to concentrate on what may be called its "persuasive" as distinct from its "revisionary" aspect. By "persuasive" moreover we mean not just what Kuhn means by "normal" science – i.e. the vast mass of problem solving research that goes on using existing paradigms and recognised techniques. "Persuasive" science is likely to be this too, but it is not only this. Or rather, we are using this word to emphasise one aspect of what Kuhn says about "normal" science. This is where normal science is not just a methodological approach but a view with philosophical implications which is treated as an orthodoxy: an instance would be "central state materialism" as the only permitted way of thinking about the brain. "Persuasive" also carries the implication of getting something across, the typical embodiment of which is the text book and set course of laboratory teaching, where experiments are set up not to discover new truths, but as *demonstrations* of something to which the answer is known. And if they go wrong you try again.

"If you get a blue precipitate
Which the book says should be pink,
You wait till no one's looking
And you throw it down the sink."

There are also the genuine experiments where the answer is not known and where *verification* is crucial and these of course occur in "normal science". (Kuhn indeed, by emphasizing the persuasive aspect of "normal science" does not sufficiently bring out that nevertheless it has both verification and falsification inside it). Occasionally there is more even than this, an even greater element of innovation, of surprise, and here we have "revisionary" science. This, again to refer to Kuhn, is not just his change of paradigm as a new *Gestalt*, a new way of organizing how the facts are seen. It is something for more fundamental which may manifest itself, as Kuhn says, in a *Gestalt* switch of mathematical vision, but may consist in the sudden intuitive adoption of a new key analogy. The point is that once a new step has been taken, all the mass of obvious experimental evidence which fellow workers are accumulating has to be

abandoned. It feels as if one has to distrust one's senses; all one has to cling to is a bare chain of argument, mathematical or analogical, which, instead of being ancillary to a constant process of direct empirical verification, now has to do instead of it.

So far, revisionary science seems indistinguishable from trying to do revisionary metaphysics, but there is one vital difference. In revisionary science there has to be some chain of argument, however long or indirect by which connection is made between the new analogical picture or mathematical system and what is agreed by all practitioners of the science to be some one key fact or set of facts. If the new system explains this, it will as well explain all the mass of simpler facts which its creator initially had to ignore. If it does not, the new revision collapses *in toto*, because by definition there is no other fact with which it connects at all.

This contrast of "persuasive" and "revisionary" science is analogous to but not identical with the distinction which Strawson (see his *Individuals* p. 9 ff.) and others have drawn between "descriptive" and "revisionary" metaphysics.

"Revisionary science" may well however start out not unlike a piece of revisionary metaphysics. This is not so likely now as in some periods in the past, since our few would-be revisionary metaphysicians such as J. N. Findlay or Heidegger, are not in touch with the growing points and strains in contemporary science, as were, for instance, Descartes or Leibniz in their day. But the first stage of the revisionary scientist's vision may be more like metaphysics in helping us to see why e.g. Descartes or Leibniz or Whitehead wanted to say some of the things they said. Yet it cannot simply be a matter of trying to say something of this kind better, on a very general level. The revision must in the end produce some key fit with some key facts – an experimental, verificatory enterprise which, however indirectly, will test the revision, and also show whether it blocks further lines of inquiry or opens them up.

All this – the need for even "way-out" revisionary science to be involved in the struggle to find verifications or falsifications – pulls scientific innovation, but its very nature, out of a purely culture-bound context.

All this being so, what about theology? Is any theology always a part of some particular culture-based fashion, or is there any sense of "theology" in which it could be thought of as a way

of finding and presenting truth, as indeed is often said? In its great ages, "theologia" was wisdom which came through mystical experience, and it was expressed in a philosophical tradition which owed much to Platonism as well as to Hebrew prophetic insight. But even this did not achieve the combination of vision with testing which could drive it forward into a universal, trans-cultural, "revisionary" way of discovery. It settled back into being "persuasive". And as frequently practised, it seems to be acquiescing in cultural conditioning instead of struggling to break out of it. The Barthian theology, indeed, was a heroic effort to break out. "The Word of God" was a revelation which could be equally at home in all cultures and in none of them. This was splendid; but as soon as anything more was said about the revelation it sounded very Germanic.

The other objection is that it is increasingly difficult to say that theology gives us *knowledge* of the world (in the old broad sense of "world" as "cosmos", "universe", not just "mundus,") as distinct from poetry or recommendations to a way of life. There may of course be truth expressed in poetry, and theology as "theoria" has traditionally been connected with ways of life (see T. to T. I, i). But unless it is possible to say what the truth in the poetry is, or show how the way of life is connected with a true vision, people become cynical about theology. Poetry, they will say, like patriotism, is not enough; or, if we are only being given moral policies, why not just take them humanistically? Further, if there is no more than this in theology, and it is so rapidly liquidating itself, why should anyone be paid to teach it?

So a lot of people are saying that we cannot go on like this. We want truth, and it looks as if the way to it must be through a metaphysical out-thrust which so relates to experience as to be more than intellectual imagination. But if there is to be genuine intellectual vision, which can be submitted to testing, then we are asking for revisionary science – revisionary science which brings awkward facts taken from deep mystical experience to the notice of disbelieving scientists.

People with this concern can have had either a literary or a scientific education; their worries are not the same.

The arts man sees science and technology becoming more and more powerful and encroaching more and more upon his life, both outwardly and inwardly. He does not fully comprehend the nature of science, but he knows that, in spite of the arrogant

claims put forward by some scientists, current science is not adequate to answer the questions he wants to ask. But most scientists will say that these are just the questions whose investigation never yields any real, firm science.

The scientist's worries are partly ethical, over the social effects of science. But more deeply, he does not see how to relate the apparently soulless universe of science to his own personal life and experiences; to beauty, love, death, including perhaps paranormal or mystical experience. Faced with this situation, the scientist then tends to search for ways of bringing other aspects of his experience into relation with what he thinks in his own work. He becomes particularly interested in anomalies arising or existing within the structure of science, since these act as clues as to where changes might come in a general view which he has always assumed to be coherent. He may be worried about paranormal phenomena, especially if these have occurred in his personal experience, but in most cases he refrains from making this concern the subject of his work because it clashes too fiercely with the current line of persuasion in science.

The arts man, by contrast, precisely tends to seek out and confront the scientist with phenomena that produce incoherences with current science. It was arts men – largely philosophers and classicists – who founded the Society for Psychical Research, and only later, with considerable pushing, did a few scientists become interested. Today there are perhaps equal numbers of arts men and scientists interested in “way-out” phenomena, but the emphasis still remains different: the former prefer what the scientist calls anecdotal evidence about monsters, ghosts, out-of-the-body experiences, while the latter, when interested at all, are more concerned with the analytical aspects of ESP, psychokinesis and precognition.

Into this complex situation, with the arts man trying for one kind of thing and the scientist trying for another kind of thing, comes the current development of a “counter-culture”; an upsurge of people who see science as a threat to their inward lives and to their outward environment, so that they develop an anti-science hate. (See Theodore Roszak, who describes all this sympathetically in *The Making of a Counter Culture*.) They are not right from a moral and practical point of view, because (unless they are prepared to let most of the population of the world die, and themselves, if they are lucky enough to survive, to go back to scratching for peanuts) they will in fact

live on and by the results of modern technology and modern medicine. They are also not right intellectually and spiritually. For if the religious man or the arts man in the end wants truth, he will not reach maturity unless he can come to understand what truth is like. He need not necessarily become a practitioner of a particular piece of science, but he must make the effort to understand the character of the scientific enterprise. So must the scientist. Far from being a tyrant, the scientist is currently in a serious predicament. He is being attacked for reasons he doesn't really understand: he is engaged in a sophisticated enterprise the nature of which he doesn't really know, but which often leads him into considerable sacrifices, fatigue and danger. As well as this he is a member himself of that same human race whose history and moral aspirations and religious institutions he is professionally refusing to enter into.

Supposing he takes notice of criticism (say by Rozzak) and becomes willing to look at the whole matter with new eyes. What should he do? It is evident there is nothing to help him in the publications of the sociological theologians, for these have abandoned both all serious search for what is right and wrong and all serious struggles for truth. As he will see it, there is no help for him in any religious tradition or any church.

So what can he do? He can occupy himself in trying to mitigate some of the worst social evils caused by uncontrolled applied science. However in the end this is a peripheral activity. He has to get to the heart of the matter and try to get a better understanding of revisionary science itself.

If he does this, and if he considers the origins of revisionary science, and the analogy of revisionary science with revisionary metaphysics, then sooner or later it is going to hit him that the picture of the deep structure of the universe as it has been given by the great mystics both east and west, is the most profound and far-reaching piece of revisionary pre-science that he is ever likely to see. Moreover, it is the piece of revisionary thinking which the human race itself (of which he is a member and to which he owes a duty) in the end cares most about, because it is the source from which all these forms of thought in fact flowed. However, the great mystics of the world never turned their revisionary thinking into *science*. Nor did the churches or priesthoods or monastic orders. All that they did was to try to demand belief in their version of the mystical picture by assigning to sets of statements or dogmata a quasi-legalistic

status. Creeds became like laws.

Only Christianity, queerly enough, did attempt a process of scientific proof of the truth of the picture by connecting it with the detail of one particular life – namely that of Christ. But from the full scientific point of view this method of proof by single exemplification has a kind of lunatic feel about it. For what the human race urgently needs to know is not primarily the truth about Christ but the truth about all men, in so far as the mystical picture gives a true account both of their potential and of the nature of the whole universe.

So the staggering, overwhelming task which confronts the awakened scientist is that of turning this greatest of all revisionary pictures into revisionary science, and of bringing it to verificational test. It is here and only here that all the varieties of activity which would commonly come under the term “way-out research” are included. After all, in so far as he is only pursuing his own specialist professional activity, why should he take any notice – say – of parapsychological facts? The first professional duty of any scientist is to make his own professional line go right – not to ponder on the total nature of man or the total nature of the universe. He will be well aware already that there are cardinal discontinuities inside science, that, for instance, quantum theory does not fit with molecular biology, nor depth psychology with physiological psychology, and anomalies will almost certainly arise as attempts are made to interrelate them. But it is no part of his ordinary duty to dwell on these (the trouble is that it is no part of anybody’s ordinary duty to dwell on them); the scientists aren’t philosophical enough, the philosophers don’t want to know, and the so-called theologians have blown inside out like an old umbrella.

But thinking about anomalies in existing science, though this is relevant, won’t of itself enable him to re-envisage scientifically the revisionary mystical picture. He has got to make this picture connect more with some facts than with other facts, and this means that both he has got to revise and enlarge his conception of physiology, human in particular, in accordance with the new “theory”, and he has got to investigate the existence of the primary phenomena which the mystics of east and west have said do exist (as did the rest of the world until recently, but which the modern scientific materialist world, under the influence of another paradigm, says don’t exist). Everything from telepathy to psychic healing, from dowsing to divina-

tion. In this investigation, he has not to let himself be carried away through hallucination, trance, or any other kind of exaltedness. He has got to remain throughout a real scientist doing real science.

This, at last, is where the religious people, and especially the Rozsaks and the modern mystics and contemplatives, can come back and help him, by being cognisant of what his task is and of what he must do, and by being prepared to submit their experience and faculties to test. It wouldn't hurt them either to do some parapsychological science, or for the doctors among them to tackle the problems involved in enlarging physiology. Once the religious people have come in experimentally, the philosophers can come in also.

What does all this come to philosophically? For philosophers who have accepted the necessity for this gigantic conceptual revision and upheaval, what comes next? We see that we have come to a point where a massive revisionary change is being called for, not so much in procedures for particular pieces of problem solving within science (though in some cases this too), as in fundamental orientation. It would be tempting to say that this would mean abandoning the "materialist" basis of science, if it were not that the meaning of words like "material" and "spiritual" is itself philosophically breaking down. With the old labels failing us, our philosophical-cum-religious act of faith has got to be that through science itself we shall come to see that some of what traditionally were called "spiritual" experiences, if they exist at all, are not just epiphenomena, but part of the out-thrust through which we hope to discover what the world is fundamentally like.

Discussion: The Organization of Cells

Two members of editorial group (A and B) talk to Irene Manton, F.R.S.

A.

There is a puzzle which you – as a cytologist – might be willing to help me clear up. An engineer, or a physicist, trying to understand a living organism would probably find the biologists' procedure unnatural in that the biologist seems to unravel a lot of different mechanisms in the certain faith that there is an underlying controlling system which gears them all together. The engineer – by contrast – would expect to get some idea, first, of the overall basic functioning of the system and then he would be able to assess the significance of the bits. If he worked the other way he would be quite likely to make gross mistakes about the subsidiary mechanisms – getting, for example, ends and means to ends in quite the wrong order. Now of course the engineer will appreciate that whatever the cytologist might like, he does what he in fact is able to do; nevertheless, the logical point remains, and I suppose the application of it might be to suggest that cell biologists might be a little more self-conscious about the overall assumptions about organization that are guiding them – most of all perhaps when they think that they are not being guided by any.

I.M.

Well, if by clarifying one's assumptions you mean setting up a working model, you have got to be very careful indeed when you start setting up models in biology. I remember very well the situation before the electron microscope when the cytoplasm was assumed to be *unstructured* colloid. It looked like that in every way and everyone assumed that that was how it was: it was just protoplasm, and very mysterious of course. Now if anyone then had been setting up general models (and there were some who did) they would have thought of all sorts of things but never have questioned the one assumption that was vital, and vitally wrong: namely the uniform-fluid (colloidal sol) character of the cytoplasm.

A.

But wouldn't it have helped if they had written down explicitly

that they were assuming that? Wouldn't that have prompted them to check up experimentally, seeing that that assumption was so important?

I.M.

It certainly was important, but the problem was *how* to check up experimentally. One had in those days, the knowledge that a vast array of different complex chains of reactions were all going on in the cytoplasm, each with its own rate controls, with often mutually incompatible reactions, going in opposite directions simultaneously to give different products, all apparently without mutual interference. When we discovered that the cytoplasm is separated by definite boundaries into regions the whole picture together with its puzzles changed. It is now known that certain reaction chains are segregated from others within membrane bounded compartments. The importance of membranes within the cytoplasm had not previously been visualized.

A.

Yes, that is a superb case which brings up the difficulties of imagining the overall control inside the cell very well. I see the case against premature speculation too, but I still sense that the cell biologist is more liable than he should be to slip into feeling "I know what the component processes are and I know that they all co-operate to produce a cell which is a going concern, so I must have understood the cell".

I.M.

I think you exaggerate the cockiness of biologists in claiming understanding and you are certainly yourself under-estimating the enormous complexity of a biological entity as large as a cell. I don't think anyone has ever claimed to understand a cell in its entirety since as you said earlier little bits of understanding have to be pieced together stepwise and there are always plenty of unpieced bits behind those that have yielded to treatment. It is true however that before the advent of electron microscopy people underestimated, and therefore tended to ignore, the vastness of the region of space lying below the limit of resolution with the light microscope but above the level of atoms and molecules studied by chemists. X-ray crystallography bridged the gap a little but for non-crystalline structures there were very few direct methods of approach. Few people can have

expected to find the vast numbers of complicated and varied objects which we now know from direct experience to be present both inside and outside cells in the space which to the light microscope appears optically empty. An early example known to me came in 1941 when Tobacco Mosaic virus particles were seen for the first time with a relatively primitive electron microscope in America. This was extremely exciting then because it showed by actually seeing a thing, that particles miles below the limit of the light microscope *were* the same general shape as had been inferred from X-ray analysis. They were rod-shaped things, and the width was about right though the length was very varied. That was the start of electron microscopy applied to an actual problem (as opposed to testing the microscope).

A.

You are making a sharp distinction between seeing and inferring.

I.M.

Yes. The Bragg type of inference applied to tobacco mosaic viruses (T.M.V. for short) had shown that they were rod-shaped particles of a certain calculated size. Whether the size was worked out by X-ray analysis alone or by X-rays amplified by other techniques such as centrifuging I don't know. But the tie-up with direct vision was a major advance scientifically and extremely exciting.

That in itself didn't bridge the gap between the cell and the molecule, and of course there are other gaps, because work which has happened since has analysed the structure of T.M.V. rods into a most elegant architectural arrangement in which almost every molecule and atom is now located to a place: it is known that the apparent rods are hollow tubes and that there is a spiral winding of nucleic acid inside the tube. The body of the tube, in fact, is made of a spiral winding of proteins of such and such a kind arranged in a very precise way. The analysis of viruses has filled in a region of space between the molecule and larger things, but there is still an immense gap between that and the cell.

B.

I come in as a philosopher with an interest in morphology.

Philosophers since Plato have always tried to find in Nature something that could be a microcosm of a larger macrocosm. Now the candidate par excellence for this is the cell because, with the current support mechanism idea, it is supposed that every cell has everything, but that some of its potential is suppressed when it combines morphologically with other cells.

Now, from what you have seen, is the cell big enough and rich enough potentially to act as such a microcosm? This puts the whole universe into the cell. But this is the sort of way that molecular biologists are now talking – without realizing they are just being Platonists.

I.M.

I would be reluctant to express views about the whole universe. I don't quite know what is meant by "the whole universe".

B.

Well, say a whole organism.

I.M.

Yes, except that the organism can emerge.

B.

Doesn't the cell emerge?

I.M.

That is an entirely different topic. There is the inherited substruction which changes only in minor ways from one generation to another and of which, as you say, various bits are suppressed. Your muscle cells, for example, and your hair cells and your eye cells all have the same total overall potential but only certain bits are allowed to function in certain circumstances.

B.

Of course that is a theoretic hypothesis, because you can't see with an electron microscope the information that's not being used.

I.M.

Indeed you can't, but the whole of cytogenetics does provide a very convincing body of knowledge that the information, which is carried by the nucleus and distributed equally by

mitotic arrangement to all cells (and then there is reduction-division and sexual fusion), is the information which carries what the situation requires for reproducing this pattern in the next generation. I think that the evidence for that is quite above board.

I may be not up-to-date in what happens if you transfer nuclei from one organism into another – say you put a nucleus into the wrong cytoplasm – but it does look as though the main information is in the nucleus and that the basis of information is the genetic code and it is made of DNA.

B.

I wasn't querying that; what I wanted to lead you on about was this:—supposing you could get another order of magnification somehow in what you actually observe in the cell, or another way of going much smaller, then what would you find next?

You accused the people who came before the electron microscope of lack of imagination. (They hadn't begun to imagine the beauty and complexity that was really there.) What next? I am interested in information – a sickening thing to be interested in.

I.M.

Imagining the unknown is always difficult and usually impossible so that I don't blame my predecessors for what they hadn't thought of. For the same reason I can't attempt to tell you what the region of space below our present limit of visibility will contain, or rather, what it will look like if and when we get down to it. I can only point out that the space available to be filled in is still quite large. There is a gulf between the DNA and the chromosome to start with. I am a cytologist and I have spent half my life studying chromosomes and there are certain things that you study in chromosomes that you cannot yet see with an electron microscope. There is space inside a chromosome for a vast amount of substructure; and that is the least successfully explored part of cells because for some reason the techniques that have yielded results up to now have been more satisfactory with other parts of the cell and least satisfactory with nuclear contents. So that chromosome structure is still a thing where direct observation with the electron microscope has scarcely added anything to what

you knew already with the light microscope. The electron microscope helps most with the lighter parts – the cytoplasm.

A.

The opposite of what you'd expect.

I.M.

Absolutely the opposite. I started life as a chromosome cytologist, and when I began teaching a course in cytology I always started historically. I also felt, "well dammit, you've got to do something about the cytoplasm", and I think I gave one lecture to the cytoplasm – as this very viscous fluid – mentioning its viscosity etc. etc. I certainly gave no more than one to the other parts of the cell – chloroplasts, golgi, mitochondria and the mitochondria and the golgi were very suspect. I remember when I was in Cambridge as an undergraduate taking part in a debate where the general consensus of opinion was that these particles which microscopists said you could stain up with Janus green were probably phoney; and now it's that bit of the cell which has expanded into a term's course.

B.

What about the nucleus?

I.M.

Speaking as an electron microscopist (and not a molecular geneticist) there is some splendid new information from direct observation of the nuclear envelope (which was also suspect – was it just an optical line? was there a membrane round the thing?) but there is singularly little else in an ordinary nucleus that you can't see just as well, or even better with the light microscope, because with the light microscope you can put differential staining so that different bits can be coloured up. You can't do that so much with the electron microscope.

A.

What are the conditions you work under with the electron microscope? Presumably the cell is very dead.

I.M.

Yes, but you see ordinary cytology is in the same boat; you can't (except sometimes with the most recent and sophisticated

methods) avoid dealing with killed and stained material. There have been most elaborate parallel series to show that the method of the killing is not introducing something gross (at light microscope level). This is perfectly clearly understood and no-one is worried about it with the light microscope because you reach the limit of resolution at 2000 diameters, and you are certainly not introducing gross distortion down to that size. Of course below that we may be totally removing the fine structure, and this is almost certainly the reason why electron microscopy of nuclei is not at present a rewarding study.

A.

What are the conditions under which you operate with electron microscopy?

I.M.

You have to have the specimen dry: it has to be in a vacuum, and it has to be extremely thin. Even a bacterium looks totally black when you put it into an electron microscope. You've got to have your specimen thinner than a bacterium. Now the high voltage electron microscopes which are being designed in France and here and in Japan may get over this.

A.

It will blast the material won't it?

I.M.

What destroys your specimen is heat, and the kinetic energy of the electrons produces heating in the stopping material. However, if they are moving so fast that they pass through the material, then they do no damage. They hit individual atoms but that wouldn't immediately alter the structure and you wouldn't burn up the specimen. The normal voltages are 60, 80, 100 KV, but millions of kilovolts are needed for the high energy electron microscope for studying whole cells like bacteria alive and, as you can imagine, the business of designing a 3 million volt electron microscope is no joke, and the whole technology of using such things takes time to develop.

No one has yet convinced me that they have put a live object in and that it remained alive when they took it out. So the present position is that you have got to kill your specimen, and you've got either to spread it out flat (and only certain

things can be spread out flat) or, you've got to cut it into thin slices.

Certain things can be spread out easily: you can *break* your cell, and this is how the DNA has been got out of viruses and bacteria complete: osmotic shock can be used to disrupt a cell so that the DNA can be made to spread out on the surface film of the liquid. You can dry that down, and you've got it out whole. Nobody has yet successfully unravelled a chromosome like that. It is so much bigger – it is bigger than a T.M.V. virus. So much space.

A.

Now what about the partitioning of the cytoplasm? You took my point about having some overall view of organization and countered it by pointing out that there was this remarkable discovery of partitioning of protoplasm, which in fact wasn't foreseen *at all*, so that any overall theoretical model would have been on the wrong foot. Can you tell us about the partitions and what they do?

I.M.

Apart from the "endoplasmic reticulum" which was a wholly new discovery, the first membrane bounded components of cytoplasm to yield to observational analysis even in a preliminary way with an electron microscope were exactly those organelles (mitochondria and Golgi bodies) which is an undergraduate I had believed to be phoney. The mitochondria have got very elaborate membrane systems *inside* (as indeed have other organelles such as chloroplasts which give the green colour to plants) as well as bounding membranes sealing them off from the rest of the cytoplasm. The experimental evidence is conclusive that mitochondria are carrying (internally) the respiratory enzymes which provide energy for the cell. The bounding membranes thus segregate some of the chemical reactions that one could not understand before as being compatible if spread throughout the cytoplasm.

Of course every single reaction in a cell goes stepwise: they are very complicated reactions. Thus in the case of respiration you have the Krebs cycle, but there are a lot of steps, and some of these cycles involve a pattern of molecules on a surface. Such patterned surfaces can in some cases themselves be parts of membranes but they are more often the surfaces of smaller

objects which can be particulate (although still multimolecular). Still smaller objects, the more mobile molecules, are then passed on from one bit of the pattern to the next bit, as on a factory conveyor belt, with one thing being added or taken off at each site.

Ribosomes are a good example of multimolecular particles of this type which themselves may, but need not, be attached to membranes. Ribosomes are composed of ribose-nucleic acid (RNA) instead of desoxyribose-nucleic acid (DNA). They are engaged in protein synthesis which is a totally different thing from respiration. Protein synthesis takes place in the cytoplasm and in the nucleus, but outside the closed spaces where respiration is going on. Mobile particles act as messengers to convey information from the nucleus to the ribosomes in the cytoplasm.

B.

As you know, there is great trouble about any concept of information that messenger RNA brings. What do you think it is?

I.M.

Well, I only know the model that one is told. The evidence is that the information is in the form of the genetic code with its three-bit alphabet.

B.

I know the form of it. The trouble is that it doesn't become information just because it has that form. It becomes information only when one thing is capable of being interpreted as something else : that is what information is.

I.M.

Well now, as far as I've understood it – not being a molecular biologist – the genetic code inside the nucleus remains inside the nucleus, but each bit of the genetic code that is going to function does it as far as I understand by making a replica of itself in RNA instead of DNA and this replica passes out into the cytoplasm as messenger RNA. The bits of the code that are not going to function are presumably sealed off by some mechanism that one doesn't know the details of – the nuclear DNA might perhaps have a layer of something plastered over

it. You don't know what it is that prevents some bits of the DNA from functioning, leaving other bits to do their stuff in any cell.

B.

It is still the case that the replica has got to be interpreted.

I.M.

It is interpreted by the ribosomes which are responsible for protein synthesis. All enzymes are proteins and almost all aspects of cell activity are enzyme controlled. Synthesis of enzymes is thus of critical importance.

B.

You speak of "interpretation" – it doesn't matter *what* interpretation – you have got the idea of interpretation: where did it come from?

A.

And the instruction to interpret. The point can be put sharply by asking how does a given molecule know when to treat another molecule as a message, and when to treat it as just a fellow to be bumped into?

I.M.

The answer to this, as far as I understand it, is structural and comparable to a lock and key mechanism. "Recognition" depends on some critical part of the surface patterning on a messenger RNA particle fitting in a precise manner with an appropriate receiving site on a ribosome. If there is no such site, the messenger will pass by as an inert particle. If there is contact (by whatever means) of the precise kind required to constitute a "locking device" activation of the ribosome follows. That is to say it will receive a stimulus (of whatever kind) as a result of which free atoms or molecules within reach will become attached to a selected conveyor belt, thereby initiating synthesis of a particular product. Selection of one conveyor belt among the millions of alternatives potentially present on a surface as complex as that of a ribosome is determined by the precise lock and key which have operated. These also determine the length of time that the conveyor belt will be used i.e. the size as well as the nature of the product and

the precise point in time at which the messenger will disengage leaving the ribosome free to receive another. It is not necessary and indeed is rarely possible to define the exact details of what is meant by "contact" and "fit", since these will vary from case to case. So also will the transmission medium i.e. the stimulus which passes across the locking device to produce "activation". Such stimuli can be varied and potentially include things as diverse as light flashes, electric pulses, free electrons, moving atoms or ions, sound waves or whatever. Effective receipt of a message requires, lock, key, the transmission medium (stimulus) and presumably also the medium of response (conveyor belt) at least in some cases. The message itself on the other hand seems to me to be the pattern i.e. the structural or other discontinuities, contained in the key and impressed on the transmission medium.

I admit that the use of an emotive word such as "information" (and the still more emotive word "interpretation") for a pattern in such a context came at first as a shock to me as a cytologist because it seemed to imply "understanding" in the human sense by the recipient. On reflection however it became clear that this type of understanding is only a special category of response and is not essential to the concept of information itself.

Does this answer in any way meet your needs?

A.

Yes, it certainly does in one important way : of course I didn't doubt that further investigation would in time reveal some mechanism for the information transfer, and it is nice that this knowledge is to hand already. However, I would be a bit surprised if the current talk of "information", "codes", "messenger" and so on were all just a *façon de parler* which could be done without. If you insisted that this kind of description and the description of the mechanisms were exactly equivalent, then I would have to go back to the point I asked you about right at the beginning, concerning the interlocking of the enormous number of control processes in a living organism, and the resulting impossibility of understanding the overall control. When you take the explanation of effects back to greater and greater molecular detail, as you do in your lock and key mechanism, so you get further and further away from being able to grasp the whole (in the sense of

predicting its behaviour). Notions like “information” have a simplifying effect and allow you to get much nearer to a model that you can handle and use predictively, but it seems to me that they can only do this in virtue of the colloquial meaning being included, for it is that which suggests how we should handle them. We can’t do without it, and it is irrelevant from this particular point of view that we know the detailed mechanisms.

I.M.

I suggest nevertheless that it is not irrelevant to remember that you and not I introduced most of these words in the first instance; I should otherwise have been far more cautious in arguing with philosophers without first defining terms. I suspect that we ought now to go back to the beginning and sort out the implications of language more fully; otherwise we may be in danger of discussing quite different things. My own interest in exploring the contents of a previously unfamiliar region of space is perhaps no more relevant to your real problem than, say, analysing the mode of action of a telephone which might incidentally be easier to deal with. At this point therefore I suggest we call it a day.

A.

Yes. I admit that my problem is rather general and would have come up in some form if you had wanted to describe the cell in terms of telephones, but you didn’t.

Engineers care for People*

Sir Frederick Warner

The celebration of any centenary is based on the search for justification. We are faced with questions which demand answers:—why are we here; how did we get here: where are we going? We need the comfort which history can give: we repeat old rites for new generations and hope they will feel comfort in the ritual. So we keep our University Chancellors and dress them up once a year to confer degrees on a new batch of graduates. The ceremony remains even if the need of gowns and hoods as recognition symbols has almost gone. We should feel poorer without it, most of all the new graduate. For the colour and ceremony are part of his demonstration in public, before his friends and his parents, that he has become part of an academic society which has a continuous history and that he has been admitted by apostolic succession. The direct bond of university membership is a fact which is not diminished as education becomes available to more people in a broadening society. The hundred years of this university have been only a preparation for the outcome of 101 years of compulsory elementary education.

The community to which we are admitted stands on the right to intellectual freedom of everyone in it. In my own world, that of engineering, this right is bound up with the duty to act, to invent, to build although the result may be to overturn social institutions. What we hold on to is the need to care for people.

It is only possible to make any sense of the assertion that engineers care for people if alternative opinion is examined. This is the thesis that technology, i.e. the work of engineers, has caused a fundamental destruction of the qualities which make life healthy and happy. The inventiveness of engineers has given us products which are not really needed or desired, but are marketed in a way to persuade people that they must have them. The resulting demand then places pressure on resources so that more and more of the earth's material resources are extracted and converted into ephemeral products which

* A Centenary Lecture given in the University of Newcastle on October 15th, 1971.

end up in accumulating piles of rubbish. Where they are not ephemeral, they can be worse – in terms of increasing building of houses, offices and factories and the scarring of the countryside by new roads, quarries and mines.

The first stage of an intellectual critique of such a system is to try and call a halt. The economic troubles of the world, and of this country in particular, would be less if the idea of growth were abandoned and society stabilized with zero growth. The second stage is to turn back, not to a pastoral society, but a simpler form of society where living in communes would reduce demands on resources. Both philosophies are normally put forward by those who have been accustomed to having the good things and taking them for granted. They are, in fact, advocating the preservation of the status quo and make no allowance for even changes in equilibrium.

I would plead for engineers to take a position based on the experience of their own work. It means a return to confidence that obstacles can be overcome, that there will always be obstacles and failures in life which are the challenge to the human spirit. The other way is to be paralysed and to exhibit the “trahison des clercs”. Passivity and inactivity are the treachery of intellectuals particularly when they appear as opposition to change rather than as part of the aspect of man which is contemplative.

The classical engineer who knew all about this was Pascal. Apart from his contributions to mathematics and fluid mechanics, he produced in the *Pensées* an intense poetry which matches his feelings and his reflections. Every schoolboy knows his phrase about the heavens: *Le silence éternel de ces espaces infinis m'éffraie*. But right at the beginning of the *Pensées* in Article 1.1 comes the passage which always comes back to me as a fundamental statement.

“Tout change: rien ne s'arrête pour nous. C'est l'état qui nous est naturel, et toutefois le plus contraire à notre inclination: nous brûlons de désir de trouver une assiette ferme et une dernière base constante, pour y édifier une tour qui s'élève jusqu'à l'infini; mais tout notre fondement craque et la terre s'ouvre jusqu'aux abîmes.”

(Everything changes: nothing stays still for us. It is the state most natural to us and at the same time most opposed to our inclinations: we are on fire with the urge to find a firm base and a final unchanging site on which to build a

tower which rises to infinity : but all our foundations split and the earth opens to the abyss.)

This passage states a proposition about change and reminds us to accept change as the most natural part of our existence. It also reminds us that all states of equilibrium are dynamic, that some changes are reversible and some irreversible. I think it is also in opposition to a current analogy of our Earth as a space-ship which needs to have all its parts designed for a closed system and everything regenerated. The Earth is far from being a closed system as long as the sun pushes in an average of 1 kW/m² at the equator.

But since the argument about space-ships is most frequently raised in discussions about deterioration of the environment, I would like to take some actual examples of change and adjustments in equilibrium. These may also illustrate the rapidity of some changes and the factors which can change only slowly through system inertia. They will come from my own background of chemical engineering and I acknowledge in advance and criticism that the field of my selection is indeed much wider than most people would allow for my discipline.

Let me start with one example from a part of industry based on Newcastle and take a look at Proctor and Gamble. They have been in the business of synthetic detergents on an increasing scale over the past 20 years. These have brought a profound change in the life of women which most of us can register. They have been emancipated from the old copper, corrugated wash-board and hard bar soap, in this country at least. Even the equivalent of pounding the clothes on rock by some cold stream before drying them in the hot Mediterranean sun has attractions only for those not engaged on the job. The work was so hard that no more than necessary was done and the standards of cleanliness had to be maintained at levels which were just tolerable or aided by systems involving re-use, such as clean collars with the old shirt, sheets put top to bottom etc.

The waste waters produced by these old methods were not very troublesome in sewage treatment works or the rivers to which eventually they were discharged. The materials they contained in the way of insoluble calcium soaps were traditional and the sewage works were adapted to them.

The position became different when technology looked for

ways of improving the washing process, so that it became less laborious but more effective. Also new materials which did not require fats for their manufacture, as soap does, were developed at a time when there were serious food shortages in the world. In terms of efficiency in cleaning soiled cloths, a remarkable advance was made. It was due principally to two components of the new washing powder, the surface active material which removed oily dirt by lowering surface tension and phosphates which kept the scum dispersed so that it did not settle on surfaces, whether of the washing equipment or the cloths. The great improvement in washing results was at once evident. The scum deposited through normal rinsing in hard water began to disappear from the pores of fabrics, leaving them brighter in appearance and softer to handle. The way was also paved for the introduction of washing machines which would not become covered with dirty residues clinging tenaciously to every corner. A technological advance of great social consequence had been made, responsible for more women's liberation than any other single agent until the advent of the Pill. It freed women from domestic drudgery so that they could choose whether to work outside the home and add to the family income. The liberating process has been continued by the marketing of fabrics which need no ironing. Its effects are demonstrated by the choices which have been made of better, gayer, more fashionable clothing among the whole population leading effectively to a more open society in which differences of wealth are not apparent from clothes. Even more, the premature aging has gone, and this is reflected in clothes and style.

This was an environmental change which should be weighed for its benefits when considering the other environmental changes which followed and were, for a time, disadvantageous. It was a change which should have halted any revival among sociologists of Veblen's Economic Theory of the Leisure Classes. The three criteria of conspicuous leisure, conspicuous expenditure and conspicuous waste vanish when the whole population is spending on luxury and waste. When it is universal it ceases to be conspicuous.

Let me return to the environmental disadvantages. These were seen first as the appearance on rivers of thick masses of foam which often built up to considerable heights and were blown across adjacent roads and property. It was also found that

the performance of sewage works was deteriorating and that they no longer produce effluents which were satisfactory for discharging to rivers. The effects were serious, as they came on top of a sewage system which was already overloaded because of the growth of population, the increased use of water and the inability to invest in new installations because of the war and its aftermath.

The problems were identified by a Government committee under Sir Harry Jephcott, an industrial chemist, as the result of persistence of the surface-active materials through the sewage works and in the rivers. The normal processes of biological attack were ineffective with the alkylbenzene sulphates which were used at the time as the essential component to be incorporated in the domestic detergents. As a result, a standing committee was set up in 1957 to find ways of making materials which could be biologically broken down in waste waters and then to find ways of phasing out the old "hard" materials.

Research and development soon produced materials which, in the laboratory, appeared to have the right properties. Their testing in actual working conditions proved more difficult. The town chosen for a full-scale trial was Luton and plans were put into action for the replacement of all domestic washing-powders by special formulations containing the new material. It took much longer than expected to replace what was on the shelves of the local shops and even after that the old "hard" material continued to turn up by routes which could not be traced. When success with the experiment was at last established, the whole detergent industry turned to shutting down the old production units and to change over to the new biodegradable materials.

The reversal of environmental deterioration has been made clear by the disappearance of foam from almost all our rivers. The exceptions I will come back to later. In the sewage works, satisfactory treatment has been restored so that they operate to their old standards of producing effluents which can safely be discharged to rivers. With hindsight, the charge is made that manufacturers should have foreseen the effects which "hard" detergents would cause, and should have held up the marketing of the new washing powders until "soft" materials had been developed. I doubt whether enough was known at the time for this kind of foresight to have been reasonably expected. We are still far from understanding all the factors involved in

the formation of persistent foam. We certainly did not know enough at the time about the effect of surface-active agents on oxygen-transfer processes.

I have deliberately excluded so far any discussion about the phosphate content of detergents. You will have read many articles and seen many television programmes which say that horrifying things are happening in the United States of America and that eutrophication is a menace which demands urgent action to ban the use of phosphates. Phosphates have indeed been banned in many States or limited in the proportions which may be used. As alternatives, the consumer is offered products which are not as effective and can be domestic dangers because they are so caustic. There has also been a great deal of research done on substituting materials for phosphates and the claims of the sodium salt of nitrilotriacetic acid (NTA) have been strongly urged, particularly in this country.

In this field of detergents, it is not enough to have reached a good position. There are always factors which can worsen it. One of these is simply growth, so that more detergents are consumed, more fresh water is used and more sewage is discharged. Unless new sewage works are built, the detergent residues will enter rivers and interfere even with the natural pressures by which they themselves are destroyed. The task of breaking up the residues biologically can be assisted by improving efficiency of the detergents and their susceptibility to alkali. The materials in the domestic detergents manufactured in this country indeed are capable of being destroyed up to 90% and over. It is necessary to be vigilant about materials, made outside the U.K. which may be cheaply imported but are not as good. The European Economic Community has a directive that materials must be capable of 80% destruction. This directive is one of those which new members of the Common Market must accept as part of the removal of non-tariff barriers to trade. Fortunately the major companies have common manufacturing standards which should protect the improvements made here without public health considerations arising. It would be ironical if a satisfactory situation obtained by voluntary agreement were to be destroyed by adopting a uniform protective regulation. I will return later to the particular problems which exist in this country and the way in which so far engineers have been able to look after us.

Before leaving this question of detergents, I would refer

briefly to the problem of industrial detergents which are used for heavy duties, particularly in textile industries. Some persistent anionic and a great deal of non-ionic detergents are still used and give problems such as those on Yorkshire rivers. I believe we are in sight of further voluntary agreement which will result in these substances being replaced by satisfactory substitutes by 1973.

I hope that this example has given some details of the interaction of technological advance and social needs. It may also have shown the different levels of needs, progressing from the removal of grinding poverty and toil to the concern for all God's creatures, who make up a glorious and infinitely various world which is at risk if exploited. The basic ethical problem for engineers is to serve man by making available for his use and convenience the gifts of nature without abusing them.

His problem is one of accountability and then of accounting. I distinguish between the two because engineering is primarily an art in which judgments are made on grounds which may not always be quantitatively exact. Accounting comes later when measurements can be made after the event, and more and more these are showing that the changes in our lives and concepts are producing complexities which require more rigorous checks and controls.

Engineering processes are today so complex that the sums to be done can be encompassed only in the computer. The sums themselves are only ordered however, by the imperfect model we construct in order to programme. The print-out should therefore reinforce and not restrict accountability but must come back to the engineer who has chosen the model. He remains an individual who cannot be left with lonely decisions. He may and indeed must, in the end take a decision on his own authority but he needs advice and criticism before he takes it and support after it. The best organizations work in this way and the worst substitute the views of committees and allow the structure to confuse responsibility.

This may seem to give a picture of the engineer which confirms the criticism that the evils of technology stem from the acceptance of a hierarchical system. The criticism of course completely confuses responsibility with hierarchy as if they were inseparable. Inside the most rapidly developing society, where change is accepted as normal, hierarchy is needed for

essential services which must take prompt action without discussion. Such services whether for fire-fighting, peace-keeping or running an airline have to have a stable recognized system in all parts of which the duties are defined and prepared for by training. By contrast industry has limited stability, little chance of prolonged periods of uninterrupted production and an anxiety about the future which results in continuous questioning. The organization which develops as a result has much more of the character of a honeycomb than a pyramid. Each cell tries to appraise its own function and checks its objectives against this of its neighbours and the organization as a whole. The criticism often made of engineers is that they become blind to things which go on outside their own cells, fail to define their objectives in terms of the needs of the whole organization and fail to consult with others. I think these failures are not peculiar to engineers but they occur and, when they do, place at risk the future of whole enterprises and their working force and weaken the country as a whole.

In my view, there will develop inside engineering the will to have the most precious designs and concepts audited. I use a term from accountancy since it seems natural that progress should be made from accountability to accountancy. Every engineer who is creative wants to feel free to drive ahead and overcome obstacles and he should be encouraged. For his own protection and that of the public, some kind of technical auditing seems inevitable.

I see the elements of auditing already in existence but not yet consciously incorporated as a function of industrial life in the way that accounts are. It seems to me possible that our next stage of control of environmental deterioration may well need to incorporate some form of auditing. The elements are already in existence in the shape of the control exerted by officials under their statutory powers over air and water pollution. But this seems to me without the advantage which auditing of company accounts gives. It is equivalent to having operations which give rise to the contamination of air and water under perpetual threat of legal sanctions. This is too extreme a position and the finances of a company are protected in a better way. The auditors of its accounts are appointed, not by the directors, but by the shareholders in general meeting. The auditors are in the first place responsible for certifying to the shareholder that the accounts have been properly

prepared and they have the right to qualify their certificate if they do not agree with the methods used and explanations given. This duty to the shareholders is also a duty to the public on whose behalf enquiries may then be made to see if any breaches of the Companies Acts have occurred.

I see the need for the process of technical accounting to become incorporated in company procedures just as financial accounting. The objections can be foreseen – that competent people are confined to those inside a company with a detailed knowledge of what goes on – that the company is already satisfied with its procedures – that it could certainly not find independent auditors adequately qualified even if it were prepared to open its books – that the operating results demonstrate that everything possible has been done.

Similar arguments could have been raised to the auditing and publishing of company accounts. It can also be stated that auditing does very little to improve the operation of companies and does not give adequate warning even when they are in great difficulties. If this is an argument at all, it is one for reform of accounting. I think the public is entitled to know how far the policy of companies is directed towards obtaining a statement of ends and achievements in an environmental protection which can be regularly and routinely reported on to management. There is need to know that the fine detail of operations is continuously scrutinized in order to reduce the escape of polluting material, to re-use whatever can be re-used and to set targets for improvement. It is difficult to see how this work can be carried on indefinitely by internal agencies only.

Of course some forms of external control already exist. The powers of the Alkali Inspectors, of local authorities under the Public Health Act and Clean Air Acts, constitute a partial control but it is not complete in the sense that accounting is. Nor is the control by local or river authorities on effluents discharged to sewers or streams. The transition has not been made from definitions in terms of quality to those in terms of quantity. It is the area where the chemical engineer's approach corresponds more nearly to accounting, since his discipline is based on describing systems in terms of the fate of all energy and all materials. His material balance sheets in fact often show two arrows at the end, one pointing up to the chimney and the other down to the drain. There is no reason why each

arrow should not bear its box containing the quantities of materials going to each sink, whether waste gases or waste waters with all their contaminants. It means that more attention will be needed during design to monitor the quantity and quality of various streams so that the masses involved can be assessed.

The transition from qualitative to quantitative statements will allow industrial undertakings to build up their own detailed accounts of what goes on internally. The existence of this information will itself generate the pressure to reduce unnecessary pollution, to have some historical criteria by which progress can be judged and make a contribution to the overall consolidated accounts which will be reasonable. In face of all the speculation about pollution and the need to have positive programmes to ensure continuous improvement, the accumulation of actual data is a positive step. It could be undertaken at comparatively little extra cost in many factories, by better attention to the systematic use of records. The adoption of a system in itself soon leads on from the initial analysis of data to identification of other information necessary to complete the picture.

It is the hope of all those concerned with problems of air and water pollution in particular areas to construct models which can be used for prediction. An outstandingly successful model, that of Pollution on the Thames Estuary, was constructed by the combination of a physical model of the main characteristics of the estuary together with a theoretical approach to the chemical and physical mechanisms responsible for overcoming pollution. The assumptions made were checked and necessary corrections made in the model by using the data, on such leading factors as oxygen concentration, which have been collected since 1893. It happens that the Thames Estuary was suitable for constructing a mathematical model because of certain peculiarities. The existence of a weir at Teddington represents a hydraulic discontinuity and gives a finite boundary to tidal influences and salt incursion. It is also full of twists and bends so that each section of the river becomes thoroughly mixed and there is no stratification in which dense salt water flows under a layer of light fresh water. These characteristics which simplify model making are not present, for example, in the River Tyne. We make progress, however, by finding ways to solve problems of increasing complexity. The solving of

the 36 simultaneous differential equations required to deal with chemical reactions in the River Thames was only possible when computing facilities became readily available. The computer also makes it possible to run through accumulations of historical data in order to improve models or to permit at worst the construction of a model to give a best fit of data by regression analysis.

Over and above all the tricks which mathematics allow us to play is the confidence given by masses of figures. Engineering solutions can be put forward to improve conditions, even where the understanding of underlying physical and chemical mechanisms is limited. The Thames Estuary has shown this over the last century, particularly in the imagination exercised after the cholera epidemic just over 100 years ago. The work undertaken to intercept all the drains and polluted streams flowing directly downhill into the Thames along its length has left us the legacy of the Northern and Southern Outfall Sewers which end at Barking and Crossness. They have borne the burden of transporting the vastly increased quantities of waste, which have come with increased numbers and water consumption, to points away from the centre of population. Even so, the river became so polluted that salmon ceased to run up the river after 1890. It is a tribute to the additional works of sewage purification undertaken steadily since then and in particular since the publication 10 years ago of a report by the late Prof. Pippard. His report made recommendations to allow work to be put in hand in advance of all the computational work connected with the mathematical model. It was a case of taking prompt action when enough data had been accumulated in advance of complete theoretical treatment.

The improvement since then has been spectacular, the most notable indicator being the re-appearance in the Thames Estuary of 54 different kinds of fish including brown trout and, in this spring, two sea-trout. This is the first recorded instance in the 20th century of this migratory fish. The records are being built up by Mr. Wheeler of the Natural History Museum by collecting specimens trapped on the filters which are used by Thames-side power stations on their cooling-water intakes. The returning life could be quickly driven away if there were any complacency about the improvement. The inexorable growth of population and water demand around the Thames Estuary requires increasing purification of the waste waters

discharged so that the demand for oxygen by the rubbish can be not only halted but reduced. For long periods of the year, the oxygen which can be supplied by fresh-water flow is extremely limited and almost all of it has to come in from the sea on the tide. A part only can be taken in direct from the air. Ever since 11 September, 1971, the fresh water flow from the Upper Thames over Teddington Weir has been 13 m³/s or 250 m.g.p.d. This has to chase out of the estuary over twice its amount of sewage having had varying degrees of treatment, arising from the activities of nearly 10 million people around the banks. There is no other situation in the world to compare with it and the engineers have served London well in controlling and improving the river. If you wish to compare the prodigality in dealing with resources elsewhere, look at the port of Rotterdam which has under 1 million people around it and needs to control the flow of water through it at 6000 m³/s or nearly 500 times as much as the Thames in summer, discharging its surplus through the huge gates of the Deltre Barrage. Let anyone comparing the waste discharged into the N. sea from bordering countries just bear in mind what these figures mean.

I have gone on about two particular fields which touch me personally as they do countless other engineers and technologists. We still need to have the social support as well as pressure and criticism to allow adequate investment to be made for meeting priority needs in the environment and to keep the earth with all its beauty of creation.

Prototypic Organisms VI: *E. coli*

Mary Osborn

Jacques Monod has said "What is true for *E. coli* is true of the elephant". That most molecular biologists have chosen, in the last two decades to work with *E. coli* rather than the elephant reflects two things. Firstly, that they believe that the rules which govern some of the most basic of life's processes, such as cell growth and division, would be the same in bacteria and higher cells, and secondly that *E. coli* is much easier to study in the laboratory than the elephant.

Bacteria are obvious choices for study. They grow in their natural environment as single cells, and in the laboratory they can be grown again as single cells in simple media which have a defined chemical composition. The time which it takes a bacterium to divide into two daughter cells depends on the type of medium on which the cells are grown: in general the richer the medium the faster the bacteria will grow. They can also be grown in large amounts so that chemical studies can be carried out, and so particular molecules can be isolated. Often hundreds of grams of cells are used, and some idea of the volume this involves can be gathered if it is realised that a cup of bacteria might contain 3×10^{11} bacteria and that these would weigh approximately one tenth of a gram. There is the further advantage that genetic analysis can be performed with many bacteria, and mutants defective in particular biochemical reactions can be isolated. That *E. coli* rather than some other bacterium occupies such a dominant place in molecular biology is largely a matter of historical accident – once scientists started working with it, and information about it accumulated, its use snowballed, so that if *E. coli* could be used for a particular experiment it was used.

The original source of the strains of *E. coli* used in the laboratory was from sewage. *E. coli* or "the colon bacillus" is one of the predominant species present in the large bowel, and its presence in water supplies is often used as a test of fecal contamination. It is non-pathogenic for man, and is handled in the laboratory without special precautions. Some strains can however cause diseases of the urinary tract in man, and gastroenteritis in infants. Most strains are susceptible to the sulfonamids, strepto-

mycin, chloramphenicol and the tetracyclines.

Growth

E.coli is cylindrical in shape, and approximately twice as long as it is wide. Five thousand placed end to end would give a length of one centimeter, so individual cells cannot be seen with the unaided eye. Under a light microscope they appear as black bodies, and by looking at large numbers of cells it can be deduced that the cells grow by getting longer (the diameter is constant) and that when they reach a certain length they divide to give two cells of equal length. Thus each molecule of the parent cell ends up in one of the two daughter cells. To determine whether the bacteria are alive or dead it is usual to test them for their ability to form colonies on solid medium. This is done by spreading a small number – say one hundred – bacteria on a medium containing the necessary ingredients solidified by agar. Those bacteria that are alive divide to form daughter cells, which in turn go on dividing, so that in a day or so each of the original bacteria that is alive has given rise to a colony of cells which contain so many bacteria that they are visible to the naked eye. The colonies are white and convex in shape, and the number of the original bacteria alive is found merely by counting the colonies.

One can also determine whether cells are alive or dead by using liquid medium. If a tube containing growth medium is inoculated with a few *E.coli*, placed in a water bath held at 37C, and air bubbled through it, after some time the contents of the tube will appear turbid, and the turbidity which is a direct reflection of the number of bacteria in the tube will increase with time. With experience it is possible to tell the number of bacteria present merely by looking at the tube.

The cells can stop growing, or change their growth rate for a variety of reasons. Some examples are too high a temperature (above 44C) too low a temperature (below 15C) exhaustion from the medium of an essential nutrient, poor aeration or infection with a virus. The cells grow fastest at 37C. In a medium containing glucose as energy source the bacteria will double in number every sixty minutes. If, in addition to glucose, precursors to nucleic acids and precursors to proteins are added to the medium the division time may be as short as twenty minutes. Eventually however when the number of cells reaches more than 2×10^9 per ml they stop growing, and the cells will only

start growing again if they are diluted into fresh medium.

Structure and chemical composition

Some details of the structure of *E.coli* can be deduced from pictures taken of very thin cross sectional slices of *E.coli* taken with the electron microscope (see Figure 1). On the outside is the cell wall which is rigid and determines the shape of the cell. It protects against mechanical damage and allows the bacterium to tolerate a wide variety of environmental conditions. From it project various kinds of appendages called pili. Inside the cell wall is the cell membrane which determines the types of molecules than can enter and leave the bacterial cell. Like most other membranes it is made of two types of macromolecules – lipids and proteins. In *E.coli* there is little visible internal structure, and in particular no nucleus and no nuclear membrane.

If one looks at the chemical composition of an *E.coli* cell, 1% is deoxyribonucleic acid (DNA), 6% is ribonucleic acid (RNA), 15% is protein, and of the remaining 78%, 75% is water. Each of these macromolecules is a linear structure built up of a variable sequence of a small number of more basic units. In *E.coli* each DNA molecule is a string of approximately 3×10^6 bases, but there are only four different bases: adenine (A) guanine (G) cytosine (C) and thymidine (T). RNA, depending on the particular type, can contain anything from 60 to 4000 bases but again there are only four different bases, A, G, C and uracil (U). Proteins usually contain 100–500 amino acids, and there are twenty different amino acids.

DNA is the genetic material

Twenty-five years ago it was not known for certain which of the macromolecules contained the heritable information. That it is indeed the DNA molecule was shown by Hershey and Chase in an elegant experiment using *E.coli* and a DNA containing virus which can infect *E.coli*. The virus contains one DNA molecule covered by a coat of protein molecules. Both the DNA and the protein can be “tagged” with substances called radioactive tracers so that the fate of both the DNA and protein molecules of the virus particle can be followed after allowing the virus to come in contact with an *E.coli* cell. It was shown that the viral DNA molecule enters the *E.coli* cell whereas the protein molecule remains outside. Since the virus replicates inside the cell, the genetic information necessary for this replication and for the

subsequent production of many hundreds of progeny phage must enter the cell. Therefore DNA is the genetic material.

Once Watson and Crick postulated their structure for DNA it became apparent that the information contained in DNA is contained in the sequence of the four nucleotides along the DNA. In *E.coli* the DNA is double stranded, and like all double stranded DNA the two strands are thought to be complementary in sequence. This means that if an A is present in one strand a T will be opposite it; alternatively if a G is present in one strand a C will be opposite it. The DNA in *E.coli* is present as 1–4 identical copies per cell. The exact number of copies present depends on the growth conditions and on the state of cell division. Each copy if extended would be about one tenth of a centimeter in length – this is five hundred times the length of an *E.coli* cell, so that the problems of packaging the DNA are obviously formidable. It has been shown that the physical form of each double stranded DNA molecule is circular. When DNA replicates the strands separate and each strand is used to form a new strand of complementary sequence. At cell division opposite strands of the parental DNA molecules go to different daughter cells. The exact details of how the cell accomplishes this remain to be worked out.

DNA —→ *RNA* —→ *protein*

E.coli has also contributed to our understanding of exactly how DNA is transcribed into RNA and how the RNA is translated into protein. This process is indicated diagrammatically in Figure 1. The information in one of the strands of DNA is copied into a particular type of RNA, messenger RNA, by a protein molecule called RNA polymerase. Ribosomes, which are small spherical particles which contain RNA and protein, (there are approximately 30,000 ribosomes in each *E.coli* cell), then attach to the messenger RNA, and using intermediate molecules called transfer RNA the messenger RNA is translated into protein. Recently it has been possible to visualize this process, and to observe the DNA, RNA and ribosomes stopped at particular points during transcription and translation. This is done by special techniques in which the contents of an *E.coli* cell are spread out on a grid before examination with the electron microscope.

One may ask what the rules are for transcription and translation at the molecular level and what the relationship is between

the sequence of bases in the DNA and the amino acids in the protein. This relationship is called the genetic code. For example, a triplet TTT in one strand of the DNA will be transcribed by RNA polymerase into the triplet AAA in the messenger RNA. When the triplet AAA is translated, one particular amino acid, lysine, will be incorporated into the protein being made on the ribosomes. The genetic code was worked out largely by joining the four bases A, G, C and U in particular defined sequences, and then seeing which amino acids were incorporated into proteins when these strings of bases were added to an *E.coli* extract. Subsequently many of these results have been verified by determining the base sequence of a particular part of a viral RNA molecule which codes for a protein of known amino acid sequence. There are 64 possible triplets since there are four different bases in RNA but there are only twenty amino acids. Thus more than one triplet codes for a particular amino acid. There are three triplets that signify no amino acid, and are believed to be stop triplets, that is the protein chain stops when it reaches one of them. It is possible to transcribe and translate some DNA and RNA molecules directly in the test tube, though with not as high an efficiency as *in vivo*.

Mutant Bacteria.

Each part of the DNA coding for a protein molecule is called a gene. One can construct a map of the position of different genes in the *E.coli* DNA molecule by using various genetic tricks. Usually one starts with a mutant *E.coli* which is unable to perform the particular function one wishes to map. Examples of the type of mutant which can be isolated in *E.coli* are mutants which require particular amino acids for growth (the normal *E.coli* does not require amino acids for growth), mutants which are resistant to various viruses to which the normal *E.coli* is sensitive, and mutants which are resistant to various drugs to which the wild type is sensitive. Isolation of some types of mutants can be very easy – for example for drug resistant mutants one spreads 10^8 bacteria on a solid agar surface containing nutrients and the drug. The drug will kill all *E.coli* that are sensitive to it, and only *E.coli* that are resistant will give rise to colonies. *E.coli* possesses very great advantages for such studies. Firstly it has a short generation time so one does not have to wait too long to examine progeny. Secondly a large number of cells can be handled easily. This is important because a particular mutant

may occur only with a frequency of 1 in 10^6 . The map that can be constructed for these various mutants shows that the genes can be precisely located on the DNA molecule, and that genes that code for proteins with a related function are often physically adjacent. One way in which the synthesis of particular proteins is controlled in *E.coli* is illustrated in the next section.

The lac operon.

In 1961 Jacob and Monod proposed a model for the way in which the synthesis of three particular proteins was regulated. Their model for the lac operon is illustrated in Figure 2. Lactose is a particular sugar which can be used by *E.coli* as its energy source. Metabolism of lactose requires two particular proteins: a bacterial permease which is found in the membrane, and β -galactosidase which cleaves lactose into smaller molecules so the cell can use it. If *E.coli* is grown on an energy source other than lactose then both the permease and β -galactosidase are found in very low amounts, of the order of ten molecules per cell. If, however lactose is used as the energy source the rate of synthesis of the permease and the β -galactosidase is increased by a factor of a thousand, and is the rate of synthesis of a third protein, transacetylase whose function is unknown.

The genes for β -galactosidase, permease and transacetylase are physically adjacent on the *E.coli* chromosome, and are indicated in the figure by z, y and a respectively. The transcription of these genes starts at a particular point on the DNA called the promoter, and the whole lac operon is transcribed into a single piece of messenger RNA. If lactose is not present then a particular protein, the lac repressor, made by the i gene, stops the transcription of the genes z, y and a. It does this by binding to a specific sequence in the lac operon, known as the operator, which is between the promoter and the structural genes. If lactose is present then lactose will bind to the repressor, pulling the repressor off the DNA of the operator, and allowing transcription of the operon.

Since this model of negative control was suggested almost all its predictions have been verified. Mutants both in the structural genes and in the controlling genes have been isolated and have the expected properties. The repressor has also been isolated and characterized. Currently both the amino acid sequence of the repressor and the base sequence of the operator are being

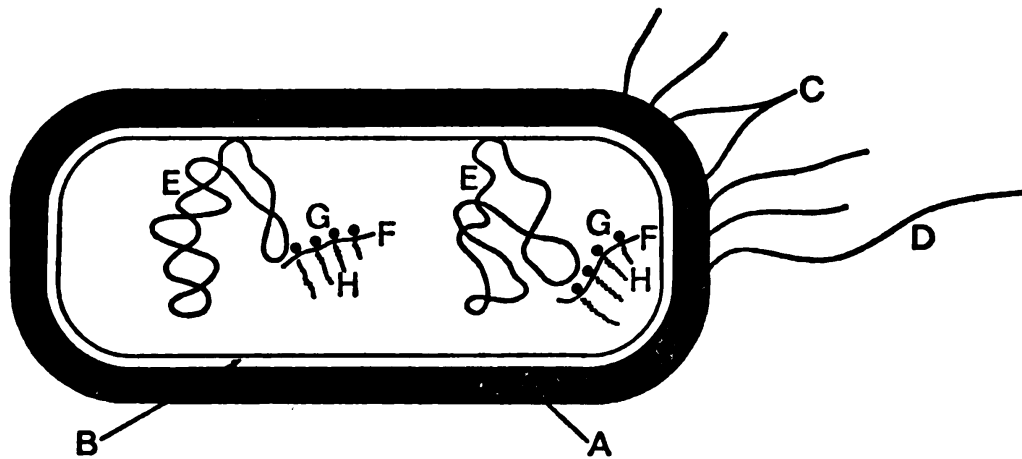
worked out. These sequences may allow us to understand for the first time how a protein recognises a specific DNA sequence.

Over one quarter of all biochemical reactions that occur in E.coli are known.

As already mentioned *E.coli* can grow on a very simple medium. It can degrade sugars such as glucose and lactose and rebuild them into the molecules of DNA, RNA and protein required for growth. The study of such biochemical pathways is called intermediary metabolism, and in many cases individual proteins that can carry out particular reactions have been isolated. As a result of such studies the pathways by which macromolecular synthesis in *E.coli* occurs are known, at least in outline, and one can estimate that some eight hundred reactions that occur during these processes could be documented. It can be asked whether there is an upper limit on the number of metabolic reactions in *E.coli*. In fact there is because of the following argument. As we have seen each set of three bases in an *E.coli* DNA molecule determines one amino acid. Thus an average sized protein containing 300 amino acids requires 900 nucleotides to specify it. The total number of bases in an *E.coli* DNA molecule is 3×10^6 , and this is therefore sufficient DNA to code for $(3 \times 10^6)/900$, or about 3000 proteins. Hence since we know 800 reactions that do occur, we may suppose that at least one quarter of all metabolic reactions that occur in *E.coli* are known.

It has been possible to outline only a few of the contributions that have been made using *E.coli* in the past few years. It is still a useful and powerful system for the study of selected problems in molecular biology and there are many people still using it as a prototypic organism. In addition much of what we know about *E.coli* has proven true for higher cells. For example the genetic code appears universal and the mechanisms for protein synthesis are very similar. Thus many scientists who once worked with *E.coli* are now studying higher cells in the hope that the knowledge we have garnered about *E.coli* may be useful in studying the much more complex cells of higher organisms.

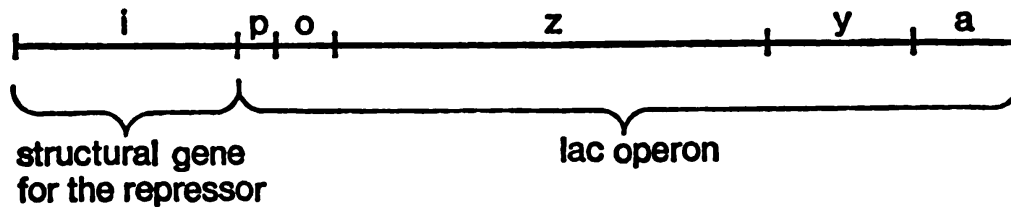
FURTHER READING: J. D. Watson, "Molecular Biology of the Gene", published by Benjamin.



Legend to Figure 1

Schematic diagram of an *E. coli* cell.

A: Cell wall which gives protection against mechanical damage. B: Cell membrane which controls which molecules may pass in and out of the cell. C: pili, or hair-like appendages, of which there may be several hundred per cell. D: F-pili, a special kind of appendage to which some kinds of virus attach, present only on so-called male cells, and usually there are only 3-6 per cell. E: DNA molecule. Two are shown within this cell. F: messenger RNA molecule. G: ribosome. H: protein chains being made on the ribosome. A-D can be seen with the electron microscope. The DNA, messenger RNA, ribosomes and proteins are shown schematically, in the interior of the cell. Individual molecules cannot be seen in the intact cell, but they can be visualized if the cell wall and membrane is broken and the cell contents are spread out on a grid.



Legend to Figure 2

The lac operon. z, y and a are the structural genes for B-galactosidase, lactose permease, and thiogalactoside transacetylase respectively. p and o are the parts of the DNA corresponding to the promoter and operator respectively. i is the structural gene for the repressor. For explanation of these terms see text.

Shamans and the Trance II

Caroline Humphrey

Let us now look at the Buryat material and attempt to find out what this process (the development from hysteric to medium to shaman) really means in terms of observable behaviour. Only in this way is it possible, I think, to make sense of the complicated Buryat explanation of what Shamans and *üzemerchi* are doing.

Petri gives the following case of a young man who became a shaman: "I had often stayed with an old, prosperous Buryat of the Ashekhobats lineage of the Kudinsk Buryat, a man who had a single son, aged 18. No-one could help loving the handsome, well-built, agile and strong youth, and I, wishing to be pleasant to the old man, praised his son. But the father shook his head and said: 'Who knows what may happen? In our lineage we have an *utkha* (a line of ancestor spirits). My grandfather was a shaman, my father was a shaman, the *utkha* missed me, but who knows, will it miss Bardakhan too?'

A year later I heard that young Bardakhan had started to have hysterical fits. I hurried to the well-known settlement. In the familiar yurt everything was as it had always been, the things were arranged as before; but a sad ceremonial atmosphere pervaded the place – I felt it in the quiet conversations, the slow movements, and the expressions on the faces. It was difficult to recognize the young Bardakhan. Pale, very pinched-looking, with a nervous face and frightened unseeing eyes, he sat not far from me. 'He has been having these fits for three days now,' explained his father. Suddenly, during the conversation, the boy jumped up; he started to shake; it was the beginning of a fit. People hurriedly undid the belt of his gown,³⁶ (it is forbidden to shamanize with the belt done up). Somehow, suddenly, with a shriek the boy leapt in the air, then leaned forward and gave a sound characteristic of Buryat shamans, – *abrrr . . . rr . . . r* – the spirit had come into him. Unexpectedly, he jumped into the air, leaping up to a height of 2 *arshins*,³⁷ and then fell on his back flat onto the floor.

³⁶ A Buryat gown has buttons at the neck, but otherwise it is held in place by a long silk belt wound round the waist. Women do not wear belts and are known as *büsgüi* "(people) without belts;" the belt symbolises the social position of a man.

³⁷ Two *arshins* is about 4 foot 8 inches.

People near him raised him by his head and stood him on his feet. He continued to tremble for some time. Then indistinctly formed words flew out of his mouth, as though hurrying and losing their way. Accompanied by his own disconnected singing, the boy danced for about half an hour in the yurt. Foam appeared in the corners of his mouth. At last he gave the same sound, – abrrr . . . rr . . . r – and the spirit went away. The young man sat at the respected post, wiping away the sweat pouring from his face with the hem of his gown. He tied up his belt again. ‘Ten times a day it’s like that,’ explained his father.”³⁸

Further material shows that the young Buryats who are later to become shamans exhibit all the behaviour characteristic of the hysteric: in addition to the loss of consciousness, the falling on the ground, and the disconnected speaking and singing described by Petri, they also grow their hair long so that it can cover the face,³⁹ keep their eyes closed, run off into the forest, climb trees, and make sure that they are not alone when the fit occurs.⁴⁰

But there are some items of behaviour which are not described for hysterics but which future shamans seem to use as a demonstration of the genuineness of the possession: the sound “abrrr . . . rr . . . r” mentioned by Petri, also foaming at the mouth, bleeding from mouth and nose, and complete rigidity of the body during the unconscious seizure immediately after the spirit has entered – it is a part of every shamanist trance that the shaman must be lifted to his feet by his head. These impressive and frightening things are necessary to the shaman’s role, but not to that of the hysteric or medium. Petri’s account makes it clear that the possibility of reproducing this specifically shamanist behaviour is suggested to the subject in early childhood, when relatives first indicate to him that they expect he may become a shaman. The doctrine of the hereditary *utkha*⁴¹ means not only that certain representations (of ancestral

³⁸ B. E. Petri. *Shkola shamanov u severnykh buryat* (The shamans’ school among the Northern Buryat), Irkutsk, 1923, pp. 9–11, slightly shortened.

³⁹ G. N. Potanin, op. cit., p. 56.

⁴⁰ M. N. Khangalov, *Sobraniye Sochinenii* (Collected Works), *Nyeskoľko slov o shamane* (A few words about the shaman), vol. 2, Ulan-Ude, 1960, pp. 144–147.

⁴¹ *Utkha* (or *udkha*) means (1) essence, meaning, content; (2) origin, genealogy. In the present context it is a line of shaman ancestors who have become spirits. Each new shaman of the line (which is transmitted through males and females) can use the power of all the previous spirits, – he can use the reincarnations of these spirits to overcome difficulties (i.e. he can become a fish in order to cross the sea) and he can ask them to help him in defeating foreign spirits.

shamans' spirits) are known in certain families and handed down, but also that a young person from one of these families is not free to behave like other adolescents subject to hysteria, since both he and everyone else would interpret any spirit possession in terms of the *utkha*. This is an important difference between the person who is simply hysterical and the person who is destined to become a shaman: the former is possessed by a spirit, – any spirit, or several different spirits, – whose symptoms arise directly from the internal psychological or physical problems of the subject; the latter must always first be possessed by a specific ancestor spirit, in other words, here there is already an element of professionalism.

According to the Buryat, the beginner shaman has not yet learnt to “master the spirit” (*ongon uralkha*⁴²), – that is, he has not yet learnt to invite a spirit down (*ongon tatakha*⁴³), nor to “inspirit” an object (*ongolkho*), nor to gain a spirit’s favour by feeding it (*ongon ideliülkhe*), nor to send away and neutralize a spirit (*ongon kharyuulkha*⁴⁴). Each of these actions (and they do not by any means exhaust the shaman’s repertoire) requires a precise ritual or verbal formulation which is different for each spirit. The shaman must know by heart an enormous body of “language of the spirits,” symbolic language which may not itself have an immediately accessible meaning, but which must have a definitive psychological affect on the shaman’s audience. One of the first conditions of such effectiveness is that the shaman’s speech should be accepted by everyone as correct and genuine.

This knowledge is acquired by the young shaman in the “other reality” – that is, in dreams and trances. The Buryat say that the shaman’s soul is taken every night to a school where it is taught by the spirits of its *utkha*. Each *utkha* has its own school. Thus the Vyerkholsk Buryats have a school on Mount Mondyrga in the Tunkinsk Mountains and the head master is Khyngyr Zarin, the eldest son of Esege-Malan Tengri. But Khyngyr Zarin lives somewhere else and does not come to the school very often. The three main teachers are Mongotoi-Zarin, Khömükhei-Zarin, and Bogdo-Zarin.⁴⁵ Although each *utkha* has a separate school, informants from various regions of Buryatia gave surprisingly similar accounts

⁴² Literally, “to master the representation of the spirit.” *Uralkha* also means “to speak beautifully.”

⁴³ Literally, “to draw (or drag) the representation of the spirit.”

⁴⁴ Literally, “to send the representation of the spirit back.”

⁴⁵ B. E. Petri, *Shkola Shamanov . . .*, pp. 17–18.

of the schools they had seen in their dreams. The young shaman dreams that he is approaching a large settlement of Buryat yurts of the traditional seven-sided type, situated in the mountains. The ancestors, with grey hair and beards, holding the shamanist instruments (horse-sticks, bells, drums, etc.) are in the village, but the young shaman cannot reach them because there is a deep, fast-flowing river between. The shaman can only cross the river by means of a *zele* (horse-hair rope) which the ancestors gave to him. Once in the village, the pupils learn the secrets of the spirits from their ancestors.

In fact, during the period of learning, which lasts until the first consecration of the shaman,⁴⁶ the pupil (called *duulashin* "singer" or *minasha*) travels round the countryside attending as many shamanist ceremonies as possible, asking questions of old people and established shamans, and experimenting with the techniques himself. Usually, an older shaman of his *utkha* (called *esege* "father") is appointed to teach him secret powers: each line of shamans has animal-representations, and the young shaman learns, if for example he comes from the Tarasinsk line, to turn himself into a wolf, eagle, goose, or camel, while if he comes from the Ongo-Khordut line he learns to become a bear and a snake. Sometimes the secrets are more sinister: shamanesses of the Ongo-Khordut line learn to cut open their stomachs, take out a three-month old child, bury it in the hearth, put the after-birth over the door, cut off their own heads and search the hair for lice.⁴⁷ The only ethnographer known to have learnt much of these secrets, Khangalov, concludes that they consist of the manipulation of the organs of the body, particularly the organs of sensory perception, hearing, vision, etc.⁴⁸

Since the information obtained by the future shaman pertains to the other reality, the world of spirits, it is natural that the Buryat should claim that it may only be learnt during sleep or in a trance. In fact, it is quite reasonable to assume that the shaman does use his period of sleep for internalizing and organizing the great amounts of material he encounters at séances and ceremonies during the day-time. Recent experimental work on sleep has shown that it is one function of a certain kind of sleep (paradoxical sleep) to promote

⁴⁶ Among the Buryats shamans are consecrated every twelve years, when each individual reaches the ages of 25, 37, 49, 61, 73, etc.

⁴⁷ M. N. Khangalov. *Tainstvennye sily shamanov i shamanok* ("Secret powers of shamans and shamanesses"), *Sobranie Sochinenii*, 2, pp. 179–81.

⁴⁸ M. N. Khangalov, op. cit., p. 181.

the synthesis of brain protein necessary in learning, i.e. there is a connection between dreaming and the memorising of large amounts of information.⁴⁹

For it should be clear that this is what the young shaman has to do. While for ordinary people, who have psychological and psychosomatic disturbances, the “spirits” are akin to what we call the unconscious, it seems likely that the entire repertoire of “spirits” must be available to the shaman at a more or less conscious level; – the shaman must be able to perceive symptoms in a patient, and, taking into account the patient’s past history, social position etc. allocate these symptoms to a spirit. By “more or less conscious” I mean that the shaman must have a conscious knowledge of the signifiers of the “language of the spirits” although what is signified may not be clear to him. In perhaps the majority of cases the shaman may in fact find out what the “spirit” represents, because there is nothing to stop him, – in other words, his own life experience does not lead him to repress such knowledge; in the other cases, where the spirits do represent unconscious, repressed wishes of the shaman himself, it is still possible for the shaman to operate while retaining the knowledge *and* the neurotic disturbance of his life. Although there is evidence that, in European terms, shamans are often neurotic individuals, it may be that the function of the shaman-tutor (*esege*), is to bring much of the unconscious material (“spirits”) to the consciousness of the shaman, – in other words, to increase his self-knowledge, and ideally, his self-control.⁵⁰

The most important result of the shaman’s conscious knowledge of spirits is that he can make (or teach other people to make) representations of spirits in the form of drawings or collections of objects. These representations (called in Buryat, *ongon*, pl. *onguud*), are part of the language of spirits – they are made up of signs which are strictly equivalent to the other signs of spirits which we have already noted: symptoms, dreams, hysterical speeches, etc. It is one of the

⁴⁹ Drugs which prevent synthesis of brain protein can prevent the formation of permanent memories, – hence it is believed that learning requires some re-structuring of brain substance. Paradoxical sleep greatly increases during massive learning programmes and is associated with brain protein synthesis. (Paradoxical sleep = “rapid eye movement” or “dreaming” sleep). Ian Oswald, “Sleep, the great restorer,” *New Scientist*, 23 April, 1970, pp. 170–172.

⁵⁰ An analogous procedure, also using dreams and the guidance of elders in advancing self-knowledge, seems to take place among the Senoi of Malaya (a culture which, incidentally, also places much emphasis on spirit-possession). Kilton Stewart, *Creative Psychology and the Dream-Watchers*, The Stewart Foundation, New York, 1955.

shaman's essential powers that he is able to draw a spirit out of a human being, where its manifestation is usually harmful, and place it in an *ongon*, where it is harmless, but before this can happen, the shaman must know how to represent the spirit in signs in order to make the *ongon*.

It is also necessary, in the Buryat view, that the shaman should "know himself." This is a concrete process which takes place during a long period of unconsciousness at the end of the training. While it is happening, kinsmen arrive and surround the young man as he lies, half-dead, in his yurt. They sing, "Our shaman will come alive again! Our shaman will save us!"

The West-Buryat shaman Bulagat Bukhasheyev has described what happens: "When they have finished teaching the shaman, the spirits of the *utkha* cook his meat until it is done, so that he should know the shamanist grammar." He added, explaining the above statement, which he had made in Russian: "*Mikhang otlood togondo shanat boloso mikha, byiere tanzhaba* – 'My meat was chopped up and boiled in a pot and (then) I knew my meat and myself.'" The *utkha* spirits had said to him: "Now we are going to cut you up and cook you until you are done. You will lie as though dead, and we will put the meat back and then you will come to life again as a shaman. But we won't be cooking only your meat, so make sure that you know your own meat! If we put back the meat of someone else, something bad will come of it!"⁵¹

But here we return to the question posed at the beginning. Why is it that the vital experience of "what is there," and real "knowledge of oneself" (*byiere tanzhaba*⁵²) implies the loss or suppression of the recognized personality? The marking of the shaman, the incorporation of his body into the *utkha*, giving him the power to enter the other reality whenever he wants, takes place in a transformation of his body that is not merely imaginary: in imagination his body (i.e. his "flesh soul") dies, – that is, it stops being living flesh and becomes raw meat which must be cooked before it can return to this days on end and exists in a state of complete collapse, – he ". . . lies half-dead, breathing almost imperceptibly, the beating of his heart can hardly be felt, and his hands and face become blue. . . ." Neither

⁵¹ G. V. Ksenofontov, *Legendy i Rasskazy o Shamanakh* (Legends and Stories about Shamans), Moscow, 1930, pp. 101–102.

⁵² *Beye* means both the body and the self or personality. The instrumental is often used to mean "oneself," e.g. *shi beyeree yereerei*, "you come yourself." (Ksenofontov uses his own transliteration, but his *byiere* must be *beyeree*).

world; and in fact, the shaman does lose consciousness for several mentally, nor physically, is the shaman "himself" during this period, and this must be seen as another instance of what we noted earlier: if someone is to experience the other reality, he must actually change (by entering a dream or a trance state), so that he is no longer himself.

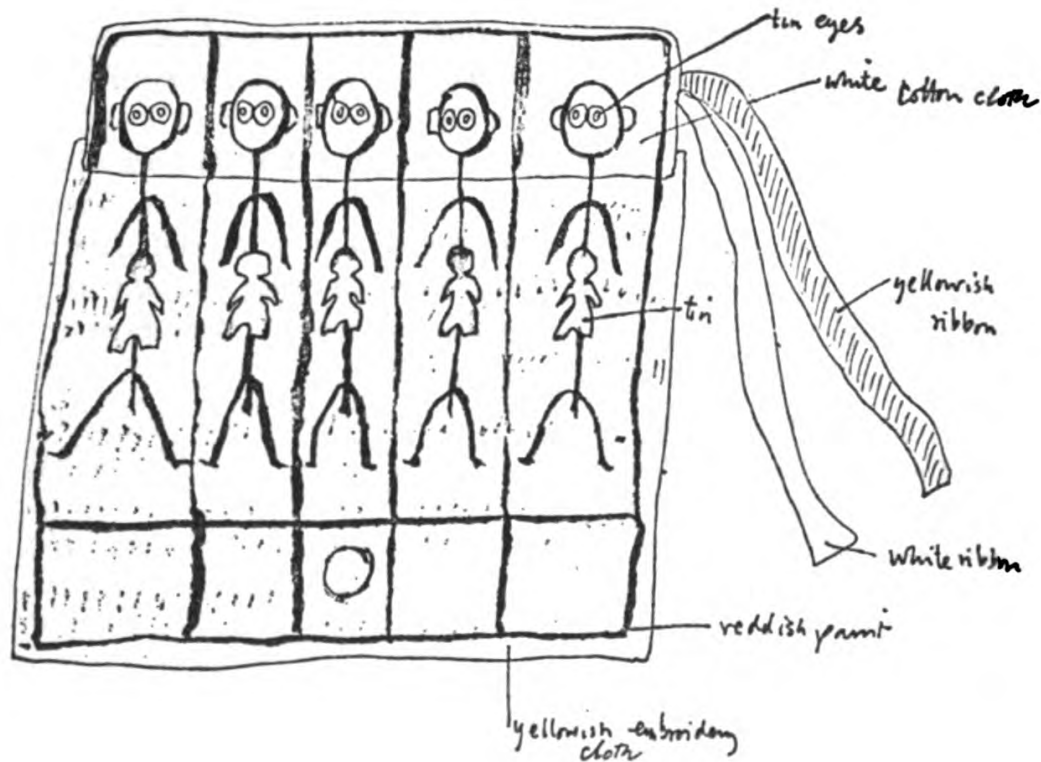
The only explanation of this that we can give here (and it must be a very tentative one) is that this removal of the everyday personality has a function which is associated with the nature of the "other reality" or, since this is expressed in words and representations, with the nature of the "language of spirits" in the widest sense.

But although the "language of spirits" on this plane of formalized speech and actions consists of signs which have undergone some distortion (i.e. the mechanisms of metaphor and metonym described by Lacan), nevertheless it would not be a language if there were not a possibility of communication on some level. Metaphors are not necessarily difficult to understand, although we may find it difficult to explain the nuances of what we comprehend, and indeed they may be different for different people. Thus it seems to me that Buryats do understand the "language of the spirits" in a way in which they cannot understand their own symptoms. But since the spirits express ideas which are unacceptable in everyday society, it is necessary that people should be able to avoid the conjunction of this understanding with their normal personalities, and this is the function of the trance.

Intellectually, this mechanism for regulating certain particular psychological disorders is made possible by the Buryat theory that human beings have several independently functioning souls, giving rise to the ambiguous existence we noted at the beginning of this article.

To sum up: the "language of the spirits" is manifested (a) in physical and psychological symptoms of illness, (b) in formalized speech and actions, and (c) in representations consisting of objects and drawings. It is possible to see a progression here, brought about by the action of the shaman: the spirit appears *first* in the symptoms of the individual, then, after the shaman has made the identity of the spirit known to the patient, in formalized speech, and lastly, after the shaman has sent it out of the human being altogether, in the representation. We have been most interested in the first transformation, i.e. the translation of the spirit from the individual plane of

symptoms to the social plane of formalised speech; this is the point at which the subject enters a trance and loses normal consciousness. Now his understanding of the position changes. No longer is he unfortunately struck down by some inexplicable power; in Freudian terms, he is no longer the subject of inadmissible or contradictory desires which, equally, he does not understand. Now he is in the well-defined and sympathetic role of victim of a certain spirit, against which there are known measures.



An *ongon* of the Kudinsk Buryats dating from the early 1900s. The *ongon* is the material representation of the spirit which has been taken out of the human subject and sent into the drawing by a shaman. This *ongon* has been made with red paint (cinnabar) on two cloths sewn together. The painted figures represent the spirits of five ancestors of the Tanakhaev lineage, the white cloth is the sky and the yellow cloth is the air between the sky and the earth. The small figures cut out of tin represent souls and the horizontal line along the bottom is an altar (*shire*) with a circular offering.

The Epiphany of the Apocalypse

William Davis

(being)

an advent meditation

*a study of the Apocalypse in
unworthy conjunction with
Daniel Berrigan's essay on
"The Book of Revelations"*

*language to be destroyed after
its reading because it is only an
explanation, not a sacrament*

Simone Weil wrote in the "Cahiers" that if a man chooses to look for God and makes his life a conscious search for God (not for the sake of having something to do, but in order to find one's own deepest meaning, recovering the truth), he will find God, or find that God has already found him. Likewise, if a man chooses to spend his life running away from God, in removing God from his life for something better that he has discovered in the depths of his own being, he too, in the end, will find God. It is the man, she says, who sat indifferent in the presence of all possibilities, even the possibility of choosing to not choose in terms of God at all, which is a possibility of finding God in itself, the man who used time as an end in itself to secure his own indifference: this is the man of whom, in the Book of Revelations, Christ said:

These are the words of the Amen, the faithful and true witness, the prime source of all God's creation: I know all your ways; you are neither hot nor cold. How I wish you were either hot or cold! But because you are lukewarm, I will spit you out of my mouth. (Revelations 3.14-16)*

* This quote from Revelations and all quotes included in this paper from Revelations or the remaining books of the New Testament are taken from THE NEW ENGLISH BIBLE, second edition, copyright 1970.

In difference, by its very nature then, does not leave open possibility of history. It is an inability to recognize, refuse, or accept God's gift to man: the ability to direct his awareness away from himself.

There is another aspect to consider before going on in more positive tones. When speaking in terms of possibilities and of their choosing, it is illusory to consider that the only interior possibilities are those of exterior action. Shortly before he died, Thomas Merton spoke at the Conference of Religions of India (Calcutta, 27 October 1968) of how action can become its own subtle kind of indifference, a turning away from a deeper realization of God in oneself which is offered in the silence and solitude, the transcendent emptiness, of contemplative experience :

You will not believe me when I tell you some of the things that are being said – of people going to their priest in confession complaining of their inability to pray. The priest says, “Why pray? I don't pray. Why should you? Prayer is irrelevant. Prayer is medieval. It is immaturity.” (You will think I am joking.) “Your action is your prayer and if your action is 24 hours a day, your prayer is 24 hours a day.” This is the life of prayer which is relevant to the world. (It is exceedingly dangerous.) In America, even some Catholic theologians have elected to go along with the popular theology – God is dead. The keynote is “horizontal”. God is no longer transcendental. He is nowhere else but purely and simply in my neighbor. Beyond this koinetic theology in which, in fact, the traditional view of God has gone and God becomes a very misty reality – over and against that you have a nation like India with its ancient flowering of religious richness of all kinds and possible dimensions. It may be said that the kind of religion which I have been talking about in our America is going to be supremely irrelevant in India; indeed, they are not interested in that kind of thing. India expects Christianity to be open to a dimension of transcendental experience which is denied by these people. Even in America itself you have a whole group of youth tremendously attracted by a deepening of contemplative life and religious experience. I would even say that it is outside the Church – that the place where mysticism is studied in America, is outside the Church in the secular institutions, by the psychiatrist, psychoanalyst not just looking at mysticism under the microscope

but with a sympathetic approach, a whole group of psychoanalysts keenly aware of the fact that mysticism can provide the deepest fulfillment of man's aspirations, and that it can help to form him into a saint. I repeat, this is outside the Church. And you get a funny situation where we, who are endeavouring to practice contemplation, find ourselves cut off from Christian Catholicism and very much in harmony with Zen Buddhism, with artists and poets, the Universities*.

It is necessary to synthesize what we have here into the perspective of history. What we have called so far, in its pure sense, a recording of exterior and interior transcendental experience, requires a deeper dimension. It is important to consider the inmost causes of a man's action and his non-action. It is perhaps not so important to understand every dimension of a cause as to consider it from an apocalyptic perspective, which is a perspective of faith.

In the fifth chapter of Revelations, John sees the book with seven seals which is the book of history; here, the symbolic record of the unfolding of man's dealings with his God, his brothers and himself as well as his environment, by means of his choices and by his indifference. But no one "in heaven or on earth" is able to open the book or look inside it. Here is an impasse – man cannot, by himself, reveal or form the future; he cannot by himself open up his eyes to this capability for self-transcendence that we have called history. He cannot make history on his own. He cannot even be evil (the negative choice) on his own. He can only vegetate in his slavery.

We are then told that it is the Lamb (Christ) who alone is worthy to open the book. Berrigan capitalizes on this point :

Jesus opens history wide. He himself is that book sealed with seven seals, which He alone is worthy to open. Being both God and man, He is both author and subject of history. As author he unseals the book, when all others are helpless to do so. As subject of history, He is victim, wounded, slain, by that same history. That is to say, He encounters the fact of evil by assuming it in His own flesh. He is the Lamb that was both slain and stands again.

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We can only conclude that, without Christ, man is unable once all the structures of indifference he has created to secure his illusion fail (as they inevitably will at an arbitrary point of singular or combined mental, emotional or physical crisis) to believe he really exists (exists in a real world), because he has never had, without Christ, an experience that transcends this trinity of awareness: the mind, the body, the emotions. In the state of indifference, these three constitute a personal universe of sin. Berrigan writes: "Men are unable to reach (on their own) a viable and workable knowledge of themselves. They are literally unable to imagine themselves in the real world; that is to say, of having moral weight, and making a difference there".

This poverty of even a potential for history, this inability of one's own power to transcend oneself, is a kind of hell that regenerates itself because, in its own bounds of awareness and experience, it cannot go beyond man; man cannot go beyond himself. In desperation, rather than turn to life and take the risks of faith, he creates a false history, a recording of indifference and its justifications, which can be done up very well in superficial academic jargon.

This is the kind of history that is studied in our systems of education: war after war after war; this is the foundation that men of indifference build on for the future. And when the need for a historical insight arises, men will logically (and have consistently done so) resort to indifference as the solution of indifference. (War as the solution to war: a war to end war.) It is eminently dangerous.

A viable definition of "history" then would be a surrender to the natural order of life. To make history is to live. To make news, however, is not to make history: it is to exaggerate one or another of the variable awarenesses of man (since we are not all in the universal awareness, i.e., Brahman) and sell it for equally variable reasons: to secure our indifference, to have an enemy, to take a trip (to have an emotional high), to make money. All of which are equal on their own level.

As the desert fathers emphasized in their "verba" and in their style of living, life is not in man's action, but in God's action within man. Truth is not to be found in the extraordinary so much as it is to be found in the un-newsworthy unaction of man that is a prerequisite to God's action; it is a simple metaphor: eliminate some of your own doings so that God can

have a space in which to move. One of the hints of the superficiality of news: the news does not make note of a man's silence, as a rule of journalism, unless it is calculated or designed for public consumption or political games. Pure silence just does not sell.

History, then, life is not to be found or made in the news. It is to be found in the invisible presence of the Source of Life within each man: as Christ says in St. John: "His (the Father's) word has found no home in you." (John 5.38) The word of God, who is Jesus Christ, is not for sale to the journalists. (If it won't sell, the news goes out of business.) But the presence of God Himself within man, offering man a share in His own creation of the real world, that is a renewal within man of the whole cycle of redemption.

If a man does not choose to either participate or not participate, he is left only to that vicious cycle of death and sensationalism that is the sole avenue of creation for those who can choose to make gods of themselves, or their thoughts or their feelings, and pursue the making of endless images of illusion, the false gods referred to by the Apocalyptic prophet simply as "the dead". To make a God of oneself is to be indifferent to the God who is the source of our own Life and the Living of all men.

Life (history), on the other hand, "is revealed to us as an entrance into struggle against the multiple forms of death that affect men and presume to claim him for their own." (D. Berrigan). In an apocalyptic sense, when man has made over himself to his own liking and then given himself over to his idols who will guard those images, he will have created an apocalypse of his own. Berrigan writes about this: "in this secular apocalypse, the end of things is a purely human act wrought in the image of sin". There is no rising after or living beyond this apocalypse; man will have destroyed himself, even beyond disaster. (It may be more than slightly facetious to continue speaking of the Apocalypse in the future tense.)

But, he continues, "Jesus offers an act of God defining the end of things"; in such a case, we men transcend "the end of things" and rise into the presence of God because He has defined the end of everything else but Himself. This is relevant to John's cry at the end of Revelations: "Come, Lord Jesus"! Whereas, when man defines the end of things, he can transcend them in his own secret way, but at the essence of transcendence, he will find only himself (which is not transcendence at all; more

likely, an emotional subtlety), since he has made himself "the First and the Last".

We ask for the coming of the Lord into man; in an apocalyptic awareness, we ask for the beginning and the end of things in us, but as a Christic event; we ask for Him who described Himself: "I am the First and the Last". (Revelations 1.17) We ask for the end to our inherent (or merely contagious through the generations) tendency toward falseness and we ask for birth, the beginning of the presence of life, of the creation of history in us, in order that we may transcend time and language, and see the Truth consuming us with its vision.

History, then, finally reveals its meaning in the Apocalyptic Christ, as being both a beginning and an ending, a birth and a dying, a living of Life by Life in and through man. Let us too pray "Come, Lord!" Let us enter into His advent, especially before we try to swallow Christmas, and find that Christmas has a throat of its own.

* * * *

I think it is important to consider these things now from an expressly self-conscious human viewpoint. It is not complex linguistically.

First, a definition of humanity, very loose: a man is living a human life (his own) when there is a transcendent balance maintained between his working on life and life working on him. It is the whole thing all over again: Christ in us, and we with the vision to see with His eyes. A joint effort then, a personal one and an historical one. It is only the man's transcendent self that is spoken of here, because this is the only self capable of contact with the Life Source: any other self, no matter what it imagines or what it encounters, is incapable, in its own metaphor, of knowing the real presence of Life.

Secondly, the tools with which a man maintains this balance. The tools are time and language. They are the measurements by which a man keeps himself conscious of what he is thinking and feeling and doing. But they are tools which must transcend themselves, and they do not have, in their own abstract way, divine natures. Time and language are, in their natural and pure state not transcendental instruments because they give no part of themselves to mystery, not in a scientific or police sense, but in an apocalyptic sense.

To take language for one : Max Picard, in his book **WORLD OF SILENCE**, says : “It is the spirit that legitimizes speech, but the silence that precedes speech is the pregnant mother who is delivered of speech by the creative activity of the spirit”. He also maintains that all language leads to silence. Silence is a mystery, a depth, an abyss where we meet God in our own original solitariness. Silence transcends the logic of language and it is the home of truth, the place to which truth returns when it is freed from the structures of words. It is something that we can enter only as our real selves. It is, ironically by the logic of all this, a mystery. Time, likewise, when it transcends the logic of its measurements leaves only eternity, which is a mystery as well. Reality can never be contained in logic, whether it be mathematical or linguistic. As was said before, a man’s wholeness is a transcendence of the intellect. It is an apocalypse all its own : it is the beginning of vision and the end of a need for our logical instruments as ends in themselves.

Then sin. Sin as language. Indifference forces language and time to become ends in themselves, and when these two are forced to become gods, transcendent entities (they can, in truth, only transform men into more mysterious illusions), contrary to their own natures, they turn on man; they control him.

The four horsemen of the book of the seven seals are evidence to all that has been said here of language, time (which is a special kind of language) and sin. The equestrians come and spread their pestilence like omnipotent gods, rooting out the foundations of existence on earth. It is only at the breaking of the seventh seal that we are brought once again into the Lamb’s presence and we are faced at that point with this statement :

Now when the Lamb broke the seventh seal,
there was silence in heaven. (Rev. 8.1)

Then follow the plagues of the six angels with trumpets; the “woes” are still only beginning. A third of mankind is slaughtered by “fire, smoke, and sulfur”. And yet, even after this, John writes :

The rest of mankind who survived these plagues still did not abjure the gods their hands had fashioned, nor cease their worship of idols. (Rev. 9.20)

Subsequently, the seven thunders do not speak. Thus a tribute to the mystery of the “vision” of Revelations : silence. And after

John eats the book of Truth, about which nothing can be written, he tells of the angels speaking to him :

Once again you must utter prophecies over peoples and nations and languages and many kings. (Rev. 10.11)

And even one last time. When the final beast appears, the final false god, it creates an image of the first beast (of the ten horns and seven heads), and "it was allowed to give breath to the image of the beast, so that it could speak". (Moreover its power lay in the fact that "no one was allowed to buy or sell unless he bore this beast's mark".) Thus the declaration of the very images by which untruth roams our planet, even today : speech, buying and selling. The escape from untruth then, must be in silence, poverty of words.

Berrigan writes : "It is the property of vision to eradicate distinctions between present and future". Therefore let us learn to see truth in what seems to be the darkness of silence. It is that abyss which is the womb of history.

And Berrigan also says : "Apocalyptic time is a mode of consciousness that includes the present and the future, but always embodied". The Body of Christ, the incarnation of the WORD of God is the way into light, the embodiment of history and the perfect consummation of language. In the Eucharistic presence of Jesus, we have the Word, being at once both silence and language, united, brought to perfection and personified in the Son of God, the Son of Man.

Another paradox in all this is that the Apocalypse, the Book of Revelations, like the gospels, is, in itself, language. Here we go one step further into a more sacramental dimension. Poetry is language which contains in it the presence of life : it does not explain life or judge it; it is life in the form of words. The Apocalypse is poetry in the structure of the gospels; therefore, like all poetry, it is a linguistic Eucharist; the Word embodied in words.

Poetry, in itself, is not a relative word; it is a presence. But the word "poetry" as contrasted to "prose" is a necessary phenomenon because prose has become a finger of technology; it explains and judges life's presence in the light of its own false deity. (Explanations and judgments create a distance between what is explained and the writer.) Prose is justifiable only if it leads to silence or to poetry. Prose has become a utilitarian

mechanism. If it were not so, the word "poetry" would be unnecessary. We would have simply pure language, a total poetry, faithful to its nature and purpose as an instrument by which man searches for a vision of truth, a tool to which man, since he is its creator, gives a transcendent dimension, which is, in reality, the same power of transcendence that Christ gives man, transferred to words, since, in a real world, a man identifies with his language. The words of Christ in the gospels then, by the very definitions of a gospel and of "poetry" contain the presence of Christ, the Word of God. When this kind of language is permitted by man to enter his silence, it returns man to the Word of Life.

* * * *

Now we reach a consummation of sorts: the precise reason that history is a good thing to have is that it contains the heritage, the tradition, the presence of God in those who lived (in fullness) before us. History, then, is a sacrament, in an apocalyptic sense. At our beginning of life, we are offered an end to sin, an end to that inherent tendency toward indifference that we call original sin; we are offered fullness of life experienced by those who lived before us. This, in Berrigan's sense, is where we are coming from. We cannot start out on our own, coming from nowhere, and expect to find something worth truth.

If our tradition then is this fullness of life, how do we pass it on without obscuring the fullness, from generation to generation? The answer is first of all in our art. As words in poetry, the various mediums of art are physical structures for the presence of life. To the degree that the artist is open to the Source of Life, the structure he creates will lead men into an abyss of silence where they will meet themselves. The artist's work then reflects his living, his fullness of life and his emptiness of self. When he creates a work of art, he carries on his tradition; he makes history.

There is still another tangent to deal with though in this perspective. It is that the man who sees the work of art may not be able to see. In a Zen-metaphysical sense, he cannot see truth when it is in front of him and cannot not see truth when it is not standing in front of him. (Double negative rule does and does not work here.) Like humanity, then, vision is a twofold potential: first there must be something worthy of sight, and then a man must be able to open his eyes.

Let us switch over again to language. The words, if the writer is true to his art, reflect his vision of truth, give the vision a structure, for the sake of communion with God and with men. The words then are something worthy of ingestion by men; they are a presence for life and so it remains solely with the reader of the words, the communicant, to be open to the vision they present. Berrigan also writes: "the reverse of our proposition is also true: a man can claim to have come from somewhere only if he is going somewhere". Thus, if a man is truly able to grasp the fullness of tradition, he is creating a place for that fullness in himself, he is making history and carrying on the tradition; he is able to see.

Language has been the greatest vessel into which tradition has been poured, and this presents a problem for 20th century man. Because words are now no longer vessels, empty jars ready for fullness. They have been already filled with the enzymes of technology, and any fullness, any history being given to words for the sake of tradition is digested and expelled with a different kind of blood: a technological haemoglobin. And man, having been given the same kind of transfusion via television and the other tools of communication for the masses (i.e., the news) cannot see; has lost his capability for vision. Man must deal with a total blindness that satisfies its own cravings for sight; in short, a monster.

There is for man, though, a sole resort. If a man chooses to expel all falseness from himself, technological and otherwise, he cannot do it through language because language will only lead him into a greater quagmire for the reasons given above. And, of course, a man cannot do it by himself. His sole resort then is silence. It is in silence that the word of God will be spoken to him and he will recover his natural abilities to hear it. It is in silence that his vision will be purified. And it is in silence that he will learn, as Raissa Maritain says in her poem, "The Prisoner", "the language of heaven". And it is in silence that we will begin again to give life to the language of all men and restore the balance of humanity in this world by restoring time and words to their natural level in the order of the world. Finally, it is in silence that our tradition will be resurrected from obscurity, and our potentiality for carrying on that tradition, for making history, recovered. Without silence, we are going to have to face hell, because, having disposed of our tradition, which is the way of Christ, the life of Christ embodied in men's

lives throughout the centuries, we will find we have no place to go.

As was said, history is the presence of God in men, and His action and non-action through men. So, in time, our silence will lead to words of life that lead man once again beyond words, because it is the spirit speaking in the words that redeems us from our own absurd wisdom. And our silence and words will then be a unity.

Christ is our tradition, our "way". He speaks the word of the Father in his Person better than we in our language. In knowing Him, we permit the Apocalypse to be a work of God and not one of man's dreadful folly. And it is in that beginning and ending that the Lord Jesus comes.

Review: *Criticism and the Growth of Knowledge*,
ed. Imre Lakatos and Alan Musgrove C.U.P. 1970

I

Professor Kuhn's book of 1962, *The Structure of Scientific Revolutions*, challenged the familiar, one might almost say the consensus, view that science proceeds by the putting forward of hypotheses which are then submitted to the test of experience. His logically central thesis was, and is, that all our experimental findings and observational reports must presuppose some theory, and that therefore they cannot constitute an impartial court of appeal at the bar of which that theory and its rivals might be judged. In other words, it is extremely problematic to ask of any two theories Which does better justice to the facts? because each will have a different view of what "the facts" are. Nevertheless, Kuhn has no wish to deny that preferring one theory to another could be a rational matter – that is, a matter of choice based on criteria. Scientists, in his view, are imbued with certain values – such that they prefer a theory of wider to one of lesser scope, for example, or a theory that is simple to one that is more complicated – values by reference to which choice between theories is typically made.

But the implications of his central thesis do not stop there. They lead to a strikingly distinctive view of the role of theory-choice in scientific activity. To say that any kind of scientific work presupposes some theoretical framework is to suggest that typically at least the scientist works *within* a theory, rather than spending his time, as the falsificationist view would imply, arbitrating *between* rival theories from a point outside them. This is indeed Kuhn's idea. Typically, he argues, members of a scientific community possess a theoretical framework which defines for them the problems to be "solved", what is to count as a "solution" and the methods to be properly employed in searching for one. Normally a scientist spends his time developing this framework – the "established" theory – by widening its scope, and applying it to unsolved problems. He is then engaged on what Kuhn calls "normal" science. The question of choosing between rival theories thus arises in "abnormal" circumstances only: when for some reason (which Kuhn of course goes into)

the validity or continuing usefulness of the framework is thrown into doubt and the “crisis” pattern of rival theories undergoing trial by criticism emerges.

In the present work, these very interesting and important ideas are discussed and to some extent taken further.

II

Relativism

Kuhn’s central claim that there is no theory-neutral way of describing experience leads him to one of his most challenging tenets: that the notion of science advancing with time towards a complete knowledge of the natural world is incoherent. We cannot think of successive scientific theories as making ever closer approximations to “the truth” about “the real world”, he declares, for the reason that in order to compare two theories with respect to “the truth” we would need to be able to set “the truth” down independently of the theories, which possibility is just what his central thesis denies. “Truth”, he is prepared to conclude, must be regarded as a term with “intra-theoretic” applications only (p.266 – here and throughout the reference is to the Lakatos-Musgrave volume).

Surprisingly, Kuhn’s critics in this volume have generally ignored this genuine attempt to be a relativist with regard to “truth” and have concentrated instead on attacking a slightly different position which Kuhn does not really hold. Because there is no “neutral observation language”, we have seen Kuhn arguing, theories cannot be compared in respect of “the truth”: for the same reason there are difficulties in comparing them in any other respect too. Rival theories offer different ways of structuring experience. Either they are couched in different terms or the same terms “apply to nature” differently in the different theories. For a proponent of one theory to understand another he has to “translate” its statements into terms belonging to his own – a task which will be possible, but fraught with the difficulties typical of inter-language translation.

Several commentators have taken Kuhn to be asserting that communication in such circumstances is *impossible*, and have quoted history against him (in the present volume see Toulmin p.43/4 and Popper p.56/7). Kuhn’s easy retort is reiteration (p.267).

Nevertheless, two points in Kuhn’s discussion need to be cleared up. The first arises out of his insistence that the debate

represented by the present volume constitutes an example of the “incommensurability” of rival theories – in this case the “theories” of science advocated by himself and Popper – and that his task must accordingly be not to put forward facts inconsistent with the rival theory but to bring about a “gestalt-switch” on the part of its proponent. He and Popper agree very largely on “the facts” (“the data”, p.3), says Kuhn; their difference concerns the patterns they discern in them. The idea here is of a collection of “theory-independent” facts or data for which rival theories offer differing interpretations.

But this is quite different from the concept of incommensurability we have seen Kuhn explaining in our paragraphs above. There he is concerned to argue that there is no “neutral observation language”, no “theory-neutral” facts and so no question of rival theorists agreeing on them. It is one thing, in other words, to say that two theories are “incommensurable” because there is no shared way of expressing “the facts” (each being couched in different terms, or terms with different meanings) and quite another to say they are incommensurable because their difference is not over the facts (the “data”) – over which they agree – but over the overall pattern which is discerned in them.

The other unclarity lies in Kuhn’s account of the distinction between theoretical developments which are part of normal science and those which are revolutionary. One would expect Kuhn to hold that the distinction must hang on *conceptual* issues – a theory would be revolutionary insofar as it was “incommensurable” with those it superseded. In fact he indicates that this is indeed his position. But he also asserts the relevance of discovering “the nature and structure of group commitments before and after it [the theoretical development in question] occurred” (p.251). This remark is brief enough; but it does suggest that Kuhn has sociological as well as conceptual criteria in mind for his notion of a revolution, and raises the question of the precise relationship between them.

The Pattern of Scientific Development

On the question of the existence and role of “normal science” the issues are again clouded by misunderstanding. Popper, for example, accepts that the kind of activity Kuhn calls “normal” science does not occur: but it is carried out, says Popper, not by the best scientists but by the second-raters – those who have

been taught badly, to accept dogma instead of to challenge it. "Normal" science is the product of "normal" scientists: science as a whole would be better off without them.

But this simply obscures the basic disagreement. Popper speaks of Kuhn's "normal scientist" and of his "extraordinary scientist". But the contrast Kuhn is most anxious to make out is not between types of scientist but between phases of scientific development. Popper's argument that some scientists fall between the "normal" and the "extraordinary" therefore flails the air (p.54).

His other point, repeated by Watkins, that some sciences or parts of science have not developed according to Kuhn's normal/revolution/normal pattern, is supported by just one clearly indicated example: "the evolution of the theory of matter" (p.54). But as Kuhn points out this is not an example of a *scientific* theory or development at all (p.254/5).

Toulmin's criticism is also based on the premise that Kuhn holds communication between rival theorists is impossible, which we have seen to be mistaken: but the pattern of scientific development he suggests as an alternative to Kuhn's is interesting. Scientific development should be regarded, he suggests, as parallel to biological evolution. A given established theory serves as the origin of a number of "variant" theories, on which "selection pressures" operate and so preserve one variant at the expense of the rest; and then out of this successful variant a second generation of variant theories arises which is subject to selection, and so on. It is however difficult to see how this idea differs in its essentials from Kuhn's: it has the same contrast between the rule of established theory and the multiplication of alternatives, suggests the same enquiries as pertinent to our understanding of science (What governs the number and type of variant theories generated? What determines which of the proposed alternatives shall be successful?). It may be that Toulmin thinks his view distinctive because of the misunderstanding of Kuhn's position (for which he may not be entirely to blame) already referred to.

In replying to his critics on this question Kuhn rather understates his difference with them. He is right to stress the dependence of the concept of revolution on that of normality; right to point out that if his critics are prepared to accept the occurrence of revolutions in the development of scientific thought, they are logically bound to accept that there must be non-revolutionary periods too. Moreover, there must be few critics who would be prepared to deny the occurrence of revolutions; there are none

I think in the present volume. But he is misleadingly irenic I think in suggesting that these points eliminate the possibility of really substantial disagreement in this area.

For one thing, there is the question of what counts as a “revolution”. Toulmin was not alone I imagine in understanding (however wrongly) Kuhn’s original notion as applying only to the huge conceptual disturbances (such as the establishment of Newtonian physics) which “tended to happen in a given branch of science only once every two hundred years or so” (p.44); and it is the occurrence of this kind of revolution which it would be difficult to deny. But Kuhn makes it perfectly clear in the present volume that his notion of “revolution” is meant to apply not only to such universal disturbances but also to developments on a far smaller scale – he gives Ampère’s theory of the electric circuit, Ohm’s Law, and Lavoisier’s discovery of oxygen as examples; and, moreover, now explains that what may be “revolutionary” for one scientific community may not be so for another with slightly different interests. A critic could therefore quite consistently accept the occurrence of the larger sort of revolution and deny the same status to the smaller changes.

Indeed he could be wise as well as consistent in doing so. For it is this variation in scale of the changes Kuhn wishes to subsume under “revolution”, and, parallel to this, the variation in scope of the theories (or “paradigms”) which he maintains are changed in the course of them, that strike me as among the most questionable aspects of Kuhn’s position. It seems one thing to suggest that paradigms on the big scale define the problems to be solved, what is to count as a solution and the methods to be employed in solving them; but quite another to make the same claim for paradigms on the small scale. We have seen Kuhn make the claim that “truth” is “intra-theoretic”, for example. This is problematic even when restricted to theories or paradigms on the largest scale, but it is very much more so in connection with developments of the minor kind now stressed.

It is also possible to disagree with Kuhn’s account of how science proceeds between revolutions (whenever they occur). Kuhn says it proceeds by applying an established theory to unsolved “puzzles” and by extending its application in a process of “articulation” (of which more later); but it is not unintelligible to hold that in between revolutions science is prosecuted by scientists putting forward hypotheses and subjecting them to tests.

Although Popper's views on the latter point are well known, where he stands on the former is, as I have hinted, hard to say. Some remarks suggest that he believes in the larger revolutions, but not in what Kuhn regards as the smaller. But then if he is talking about conceptual changes on a really grand scale his claim that "we can break out of our framework at any time" (p.56) is indeed remarkable. Innovation *on this scale* amounts to the elaboration of a new language, which of necessity must be a cooperative enterprise (for reasons developed by Wittgenstein and others); on this ground alone, swapping one framework (in this large sense) for another is certainly not a matter of the whim of the moment, as Popper's remarks suggest (p.56).

Clarification, description and advice

Throughout this debate there runs the perplexing confluence of historical, conceptual and normative concerns. Most of the contributors demonstrate their awareness of it. None, except possibly Kuhn, has anything helpful to say about it.

It is quite possible to distinguish different questions which seem to receive discussion in these pages. As a matter of history, how has science developed up to the present time? (Let us call this problem a *descriptive* question.) If the best scientific advance is to be made, how should scientists set about their business at the present time? (A "normative" question) Is Kuhn's concept of a "revolution" a coherent one? (A "conceptual" question) But to distinguish questions in this way is to reveal the problems, not to solve them. Toulmin is too sanguine when he recommends his own proposals on the grounds that they help "locate the ambiguity . . . between the philosophy of science, which is concerned with the question what consideration *should properly* determine the selection [between rival theories], and the psychology or sociology of science, which is concerned with the considerations that *in fact* settle the matter" (p.46 – Toulmin's italics). Won't the sociologist need to distinguish genuine from bogus science? Is the science student being taught the *philosophy* of science when he is told (correctly or incorrectly) why theory A is to be rejected in favour of theory B? It is sensible to imply that science might *always* as a matter of fact have been pursued wrongly? Toulmin's italics do not help at all with these problems.

Let me emphasize just one important way in which the situation is much more complex than these distinctions suggest. It is indicated by the constant conjunction, so beloved of syllabus

writers, of “philosophy-and-history” of science : there cannot be a philosophically neutral account of science’s development. A historian who accepts Kuhn’s ideas about the nature of science will acquire a different version of “the facts” from the historian who rejects them in favour of some other. Pearce Williams oversimplifies therefore in suggesting that it is only increased knowledge that will enable us to judge whether Kuhn (or Popper) is right, and in appealing to the image of an “historical foundation” upon which “philosophical structures” might be erected (p.50). We need a conceptual framework through which to understand the development of science before we can give an account of its history, and this is just what (among other things) Kuhn and Popper are (severally) offering.

Kuhn’s sense of paradigm

One conceptual enquiry that rather surprisingly receives little attention from the present symposiasts is into the nature of Kuhn’s own thesis. Most treat his writings as though they were obviously and perfectly intelligible, and address themselves to the only question that they seem to think arises : Is what he says *correct*?

Miss Masterman is an honourable exception. She has read Kuhn with great care and has pursued the very necessary preliminary question What *exactly* is Kuhn saying? – and in particular What *exactly* does he mean by his crucial term “paradigm”?

Her answer is “Many things”, but she picks out one as basic, which she labels the “construct paradigm”. It is the application of a “construct paradigm”, she says, which makes scientific activity in a particular area possible. For what is needed to initiate such activity, she says, agreeing with Kuhn, is the establishment of a “puzzle-solving” tradition. The field has to be structured in such a way as to present the scientist with a series of problems which can be solved by applying straightforward techniques – “puzzles”, as Kuhn calls them, so as to make the distinction between them and the less defined, intellectually obfuscating “problems” having no agreed method of solution which are typical, for example, of philosophy. It is this structuring that is provided by the “construct paradigm”.

(Miss Masterman makes much of the fact that the “construct-paradigm” must necessarily be a product of human activity – an “artefact” – though the reason she gives makes me wonder if

I have understood her properly. Since puzzles are necessarily artefacts, she says, artefacts must be used to solve them: and hence the construct paradigm is necessarily an artefact. But according to the only sense I can make of this idea, puzzles can only arise with the imposition of an artefact (a conceptual structure) on a given area of experience and for *this* reason the construct paradigm must be an artefact.)

Miss Masterman then tells us that Kuhn's idea is that the construct paradigm necessary to initiate a puzzle-solving tradition, and thus a period of "normal" science, is necessarily a representation of some already familiar phenomenon. Applying a construct paradigm is therefore a proposal to use a representation of one phenomenon as also a representation of another: the striking of a metaphor. We are given a "way of seeing" the area of experience in question: a picture, for example, of one, familiar, area of experience is proposed as being also a picture of the area that is new. It is the fact that the construct paradigm, and thus the theory with which it is associated, has this dual "concreteness" (it is a representation of *two* fields) that essentially distinguishes Kuhn's view from Popper's, according to Miss Masterman; and clearly she regards this comparison as very much in Kuhn's favour. Her explanation of why this should be so is however rather disappointing. She declares that "quite obviously and in fact" scientific theories have both types of "concreteness", and she gives an example; but otherwise she merely alludes to the arguments put forward by others.

Of these, there seem to be two that command respect. First, only if a theory has associated with it a *model* (Miss Masterman seems content to regard "model" and "construct paradigm" as equivalent, at least in this context) can there be more than guesses when it comes to extending the scope of the theory. For, it is argued, the fact that some correspondences between model and field have been established gives good reason for thinking that others will also hold. Putting forward an hypothesis which postulates such other correspondences is therefore more than it would be otherwise – just a shot in the dark.

Second, any particular set of data can be represented by any number of different mathematical expressions. If however it is accepted that in building a theory for a particular field a model has to be adhered to, choosing among these different mathematical developments becomes possible.

To the first argument it can be replied that we are not bound

to have reasons for putting forward particular hypotheses, and that even if we were, "articulating a paradigm" would not provide them. To the second I think the Kuhnian response would be that the preservation of a consistent model is not always the criterion on which theory-choice is based, as the recent history of physics can be represented as showing. It would then not be true that every theory needs a model to "guide" and "restrict" the theory's articulation, "excising and removing, by the need to preserve it, the otherwise excessive possibilities of abstract development inherent in all mathematics" (p.78). Of course this is the beginning not the end of a debate; but because it concerns Miss Masterman's principal points it is something of a pity that she has not in her paper embarked upon it. (And perhaps this is the place to add that my account of Miss Masterman's discussion may well involve misrepresentation, for which I offer only half an apology: I find her writing consistently – and sometimes, I confess, irritatingly – obscure, and the fault I think is not entirely mine.)

The workings of normal science

Miss Masterman concludes her contribution by addressing a problem which Kuhn himself pursues in his closing paper. How does normal science proceed?

Normal science, both agree, consists of two processes: the application of a given theory to new problems of the kind it has already been successful in solving, and the extension of the theory to cover new *kinds* of case. The second process, with which Miss Masterman deals, she regards as continuing articulation of the original construct paradigm with experience. When a paradigm is first applied to a given field many of its features are ignored; but once the initial proposal has established itself the possibility of further correspondences (involving these hitherto "unused" features of the paradigm on the one hand and unmapped areas of the new field on the other) can be pursued.

The principle involved, says Miss Masterman, is one of "replication": the scientist is attempting to build a system which "replicates" the "main features" of the new field. It apparently proceeds by the scientist's "intuition"; but Miss Masterman suggests two types of mathematical treatments which may be at the bottom of the mental computation which must, she thinks, be involved.

The first is the technique used in numerical taxonomy (as

well as elsewhere) to sort a congeries of individuals into groups of "overall similarity"; the other is a technique which enables one to pick out from a set of individuals the one that is "most like" a given individual outside the set.

Miss Masterman says very little about these suggestions, but one comment is I think in order. Both approaches rely on the possibility of treating the individuals to be compared (paradigm on the one hand, field of experience on the other) as though each possessed a fixed and definite number of characteristics (Miss Masterman, p.86): But this assumption cannot properly be made. An individual can always be described in a number of different ways, and each way divides it up, as it were, into a different set of characters. There is no such set, in other words, as *the* set of characters possessed by a given individual. (It follows from this that the approach to classification known as "numerical taxonomy" to which Miss Masterman refers is founded on a mistake, a conclusion I embrace and further defend in my forthcoming "Numerical Taxonomy".)

Kuhn's account of the other aspect of normal science, the application of an established theory to problems of the type it has already been successful in solving, also turns upon a similarity relation : how does the scientist pick out a new problem as "similar" to those already solved?

It is a mistake (in fact the *fundamental* mistake made by the falsificationist), he explains, to think that a theory embodies criteria which allow all empirical eventualities to be classified into those that would confirm the theory, those that would falsify it, and those that would be irrelevant. The truth is that the theory itself typically leaves unsettled the question of whether a particular instance falls under it or not. What the scientist has, instead of rigid and unambiguous rules specifying the relation between the theory and all possible experience are the actual concrete applications the theory has had in the past; these, acting as "paradigms" (now obviously in a sense different from that of Miss Masterman's "construct paradigms"), enable the scientist to develop an idea of what counts as "similar" situations for the theory in question and so to judge when it applies and when not.

In Kuhn's view, the basic process here is central both in acquiring current scientific knowledge and in research. The student, as two aspects of but one activity, learns about the behaviour of the world at the same time as he learns the

meaning of a given theory's terms: and both by (among other ways) familiarizing himself with the concrete cases in which the theory has been successfully applied. The research worker, in establishing new facts about the world at the same time and by the same stroke applies a theory to a new situation, a situation which he discerns as "similar" to those to which the theory has been applied successfully in the past. In both cases Kuhn stresses that the ability to judge "similar" situations (in relation to the theory in question) is acquired by becoming familiar with exemplary problem solutions. But we cannot, he goes on, be content to describe this ability as an intuitive one. Like Miss Masterman, he sees the necessity to provide an account of the logical principles which underlie the scientist's intuition. I have not unfortunately been able to consult the paper where he begins to outline such an account ("Second Thoughts on Paradigms", in Frederick Suppe (ed.): *The Structure of Scientific Theory*, 1970) and he says very little on the point here; but the project has great interest for philosophy in general, promising, as it does, to make something rigorous of the very important "family resemblance" theory of general terms.

III

This volume, which consists, perhaps we ought to record, of papers by Professors Kuhn, Watkins, Toulmin, Pearce Williams, Popper, Miss Margaret Masterman and Professors Lakatos and Feyerabend, is represented as the written record of the part of the 1965 International Colloquium in the Philosophy of Science held at Bedford College in London. No debate, one might remark, could ever have stood in greater need of the "rational reconstruction" proclaimed in the preface (and elsewhere). Of the three planned main speakers Professor Feyerabend "could not come", Professor Lakatos did not have time to finish his paper and Professor Kuhn, trapped at the last minute into producing a statement instead of a reply was obliged to advance his schedule and rush his paper over the Atlantic a paragraph at a time to an anxiously waiting Professor Watkins, who had rashly agreed as a stand-in to prepare a response in the handful of weeks that remained (p.25). Who can say that the bare record of history on this occasion should have come before the public unclothed?

And yet the editing is not without its touch of the bizarre. It might not matter that by far the biggest contribution, by

Lakatos, did not figure in the original debate at all; but it matters rather a lot I think that it should be announced as a *crude* version of a book *already* published separately (p.91). This is part of the reason for its neglect in the present review. Then again, although almost five years elapsed between the symposium and the publication of this written record – time enough, as I say, for some papers to be “rationally reconstructed” out of the thin air – of the other contributions at least one bears all the signs of the impromptu (I am thinking of Popper’s, and particularly of the extraordinary cluster of ill-assorted remarks that constitute his peroration).

In philosophical quality this work is variable. Several contributors are prepared to criticise where they have not read carefully enough. One is even prepared purposefully to mistate a position in order to make it susceptible to attack (Watkins, p.29). Emotional rhetoric and quite unhelpful factionalism intrude more than once. I agree with Miss Masterman’s first footnote on p.61, though not with her idea that it justifies (milder) intellectual thuggery on her own part. But there is plenty of careful and stimulating thinking too, particularly in the papers by Lakatos, and Miss Masterman – and in the two papers by Kuhn himself, which are superb.

Vernon Pratt

Comment:

Energy transducing in the brain: Needham on Chinese Culture

Your cover design for January 1971 was of particular interest, since it shows the influence of a remarkable little book (*A Rhythmic Approach to Mathematics*, London, George Philip & Son, 1906) in which two remarkable women co-operated: Edith L. Somerwell who wrote the text and Mary Everest Boole (daughter of George Boole) who wrote the preface. These ladies were instrumental in adopting for children a fascinating method of creative design, as comparison of your January 1971 cover design with their plates (II3, VI, III2, XIXa(8), XIXb(a), and XXIIa) shows. The last two were both designed and worked by children, the last one being done by village children in Norfolk.

Your first sentence on page 3 (Jan. 1971) very ably and succinctly summarizes my own conclusions as to the fruitful way to investigate dowsing, and psychometry as well, which must be closely related to dowsing, and of which there also exist remarkable case studies.

What my researches have particularly sought (by techniques that include logic as well as what may be called exotic, i.e. unfamiliar, algebras and their arithmetics, together with their inherent meta-geometries) has been the *energy transducer* that mediates between the self and the brain. (Note the difference between the two as brought out, for example, in the fine article you published by a brilliant mind whose body had suffered a grievous brain stroke.) Since we now know that the brain works by molecularly based micro-electromagnetic field changes, this transducer must be such that it converts a volition into a tiny bit of electromagnetic energy, so as to trigger a desired sequence of biochemical and biophysical events culminating say, in the act of raising one's hand to do something or focusing one's eye to read, or moving one's legs and feet to walk or run. The nub of the matter is in the initial triggering or directive energy at key points in the brain. That such energizings are evocable at will is, of course, the common experience of every person in his right senses.

My work shows that the first bodily (and small) energies mobilized by this tiny triggering spark transduced from volition are the free energy packets (principally the so-called London forces) required

and known to exist in all organisms by modern quantum biology. I have written a more technical paper on the nature of the process by which these at first randomly distributed indeterminate energies would be focused and directed, i.e. giving a distribution more like that of an impulse than a Gaussian spread (see p. 75 ff., *The International Journal of Bio-Medical Computing*, January 1970).

Speaking as a former resident of the Middle East and Europe for ten years, and as one who has lived in Asia and Africa, my reactions to Joseph Needham's piece on Mao-tsê-tung were mixed, for I deeply share the author's ideal of man not engaging in subjugation or debasement of his fellows. Dr. Needham, however, glosses over the failures of Marxism in achieved (post-Revolutionary) practice to do anything but ape a giant, monopoly capitalist corporation, cartel, or corporate farm called "the State" or even more incorrectly "the People".

As Walter Roberts so well said in *Theoria to Theory* (January 1971, page 6): "The direct management of society by theological persons is a disaster that is unlikely to be repeated, but it continues in disguised form under secular dictatorships." Mao's is even not so secular. He is an Asiatic *hutuktu*, to use the Mongol term, "a living god", as were some of the emperors of decadent Rome.

If we regret the depersonalization effected by modern technology in capitalist countries, we must regret even more its intense magnification in a marxist-type state-cartel, where there is on principle an utter neglect of every individual as such within it except its Maos – the Party clique, a parasitic in-group who write poems and live high on the hog (doing token bricklaying as capitalist officials lay cornerstones on occasion) – while the masses toil for Mao's imperial glory and celebrate his adored personage in the form of his image or his picture or other ikon, when the August Presence is not there.

Needham has also schizophrenically forgotten that it was Maoists who desecrated Confucius' grave and that when Lao-tse spoke of *Tao* it was not physical nature or even Nature with a capital initial, but an all-immanent all-transcendent merciful and compassionate power that could be termed nothing less than divine awareness, though most remain unaware of it. "Though despised of men I am comforted by my Mother Tao" wrote Lao-tse. "I am among men like an infant who has not yet smiled . . . I am called foolish (by the worldly energetic)." This is not Maoism in any shape or form – but reminds us much more of him who once said "foxes have their holes, but the Son of Man has nowhere to lay his head."

Needham's argument is vitiated by his obvious misconception of Taoism. What he misrepresents as Taoism appears to come from Maoist pamphlets rather than from the *Tao-teh-ching*. Moreover, Lao-tse taught, as most central to his enterprise, the doctrine of individual survival after bodily decease and also of the definite possibility within the scheme of things that men as individuals could attain immortality even before death, with the development of a miraculous body not of our matter.

Chapter 54 of the *Tao-teh-ching* contains the old character chen (also found in Chuang-tse, as well as in Chinese alchemy in the best Jungian sense) used to denote the process by which man could achieve individual immortality. The oldest Chinese dictionary, the *Shuo Wen*, clearly explains that character. But it has not been hitherto noticed that it occurs in Lao-tse, which has occasioned mistranslation. The passage in question, the 4th sentence of Ch. 54, correctly translated, reads:

Who cultivates Tao in his body will attain the Teh (power associated with Tao) of immortality.

We have seen this sentence bowdlerized into "cultivate Tao in your person and its virtue will be genuine", or even worse, "accept Tao in yourself and Teh is yours", and, now utterly garbled, "realized in one man, fitness has its rise".

It is a pleasure to say that the drawbacks reviewed above did not so vitiate the second article by Joseph Needham in *T. to T.*, volume 5, second quarter, in which he becomes more removed from the source of his intense bias, and in the same measure very much more refreshing and reliable.

On page 76 he reaches a high point of insight when, influenced by Walter Pagel, he stresses our regaining "that realm of Hermetic inspiration and idea-sources . . . so important for the history of thought". However, on p. 72 he again lapses into the systematic error of his characteristic and logically dangerous assumption that Chinese culture was indigenously produced in effective isolation. In particular, Needham consistently neglects the powerful influence of India on Chinese philosophy and belief, as well as the interrelations of Iranian and Sumero-Babylonian culture with Indian culture thus passed on to China, let alone the influence of direct embassies in pre-Christian times from Europe to Imperial Chinese provinces, e.g. that from Rome to Hanoi. This is shown by linguistic-scriptural evidence in the former instance and in the second, by the ancient Indus Valley seals found in Mesopotamia (and vice versa for the

Indus Valley sites). Thus on p. 72 (*T. to T.*, vol. 5, no. 2) he writes: “Chinese culture *alone* provided that *materialist* conception of the elixir of life which, passing to Europe through the Arabs, led to the macrobiotic optimism of Roger Bacon and the iatro-chemical revolution of Paracelsus” (italics ours).

First, the Chinese elixir of life was Taoist, and hence not materialist. The immortal body it led to was no longer matter in any sense we know – being now able to be undamaged by any of the natural elements, including fire, and being able to teleport, and to permeate walls. We thus revert to Needham’s deep misunderstanding of Taoism. Furthermore, the elixir-of-life concept came to China by way of the ancient Vedic *soma* tradition of the divine plant of immortality. That tradition in turn has common roots even further west in the Sumero-Egyptian concept of the plant-based elixir of life, shown even in the bas-reliefs of later Assyria in the hands of gods, and featured in legends of the goddess Isis of Egypt where, as in India, the elixir of life was linked with a concept of a higher kind of energy called the fire of life, which reappeared in later alchemical thought. Paracelsus and Roger Bacon had their sources not in China, as Needham so farfetchedly strains to allege, but in the Egypto-Babylonian Hermetic tradition and in the ancient Hindu Iranian Aryan traditions fused with it.

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Participation by Public Inquiry

Timothy Aldworth distinguishes between participation on a political level and participation in planning at a technical level. A distinction of another kind is between constructive participation in a local authority’s development plan and participation by objection to a planning proposal in which early participation would have been impossible. The Skeffington Report was concerned only with the first of these. From the earliest days of these development plans the more progressive local authorities have tried to engage public interest, though others have waited until they were so deeply committed to a particular set of ideas that they were inviting *comment* rather than participation. But the 1968 Planning Act now *requires* local authorities to invite

participation at an early stage from “persons who may be expected to desire an opportunity of making representations”, described in Skeffington more colourfully as “. . . the active minority, the yeast of the community”. Skeffington also discussed ways of involving the interest of those outside this circle, – as “. . . those who do not join societies or attend meetings”.

Whether people should be hounded into participation is perhaps questionable. Local authorities could perhaps put the equivalent effort into improving their schools, so that the next generation would all join societies and attend meetings. However, this will not be in time for the new Structure Plans under the 1968 Act which are expected on the Minister’s desk within a couple of years.

But development plans are only one side of the planning coin; moreover they are finite in number, since the number of plans cannot exceed the number of planning authorities, and they only occur at intervals of many years – though amendments to them are more frequent and can be complicated. On the other side of the coin are innumerable day-to-day planning decisions, unpredictable in number and importance, in which the public could not possibly have participated in their early formative stages – for example in the plan of the Shell Company to erect a North Sea gas terminal on the Norfolk coast; of the Gas Council to put a gas-holder in the middle of Abingdon; of I.C.I. and the Water Board to build a reservoir in Upper Teesdale; of the Central Electricity Generating Board to site a power station in a green belt; or of Richard Thomas and Baldwins to extract ironstone from the countryside near Banbury.* In these cases the public can only object, but the public inquiries at which their objections are heard are one of the great democratic devices of our time.

But “objection” in this context is not necessarily a negative or unconstructive exercise. Corporate objectors usually freely admit at the inquiries that the proposed development has got to take place in one form or another, and produce alternatives which will do less violence to the interest that they represent. Naturally what they suggest is going to harm someone else’s interest instead of their own, but part of the object of the inquiry

* These five examples have recently been examined in great detail in a volume of case studies. *The Price of Amenity – Five studies in Conservation and Government*, by Roy Gregory, published by Macmillan in 1971 at the regrettable price of £8.

is to discover how to do the least harm to the smallest number, and it is the inspector's task to weigh one claim against another in making his recommendation. In other words objection may be a form of delayed participation. Some years ago, for example, the CPRE, the National Trust and local amenity societies spent considerable sums on commissioning engineering consultants to design an alternative scheme for supplying water from Ullswater to the City of Manchester; and in the recent London airport inquiries local pressure groups have done much the same on a remarkably large scale.

These open debates on the environment, for that is what they now amount to in practice – even though it is far from their original purpose – may be launched in various ways. They may be appeals against the refusal of a local authority to give planning permission. They may be inquiries into objections to the plans of a private developer or of various statutory authorities exercising “deemed planning permission”; in the latter case the holding of a public inquiry may be mandatory but is more often discretionary. As a kind of back-stop the Minister may “call in” a planning application if it seems sufficiently important or controversial, and decide it himself in the first instance instead of merely being a possible court of appeal; in fact he does this about a hundred times a year. Occasionally the Secretary of State for the Environment himself may be a developer, though broadly speaking this only happens with new towns and trunk roads or motorways.

But whatever their statutory origin planning inquiries may quite possibly ensure that the will of the *minority* prevails, to the greater good of posterity maybe, but raising fascinating questions about the nature of democracy. Is the environment to be managed by counting heads? Ought members of local planning committees to reflect the wishes of their constituents or, as in Parliament with capital punishment, to make up their own minds? Ought self-appointed and unofficial pressure groups, almost always a small minority, be able to influence decisions as much as they do? In the last resort, ought the Minister to be able to overrule everybody, where Parliament has devolved planning decisions in the first place on elected representatives? These things are happening all the time in various guises.

The smaller local authorities, such as borough councils with delegated powers, must be concerned with local trade and rateable values, and their members tend not to be elected for their

aesthetic judgement or knowledge of the fine arts. They may properly prefer a supermarket to an eighteenth century facade, and the new buildings they approve may be distressing to the local preservation society. But if the matter goes to inquiry and the proposal is defeated a minority will have prevailed over the wishes of the elected representatives of the people. Conversely a local authority may itself be the guardian of the minority view. A few years ago the Derbyshire County Council refused permission for a motor racing circuit in a semi-rural area, and were upheld on appeal by the Minister; but the scheme was popular locally and a referendum would almost certainly have approved it.

A case of some complexity arose in 1968, when a private developer applied for planning permission to build a holiday and sports centre in the Vale of Appleby in Westmorland – dormitories, restaurants, sports hall, ice skating rink, gymnasium, theatre, night club, yacht basin *et al.* The Westmorland County Council, the North Westmorland Rural District Council and the Appleby Borough Council approved the plan in principle, since population and prosperity were declining and there was urgent need for new employment. Individual landowners and tenant farmers objected, as did the amenity societies. The Ministry of Agriculture objected to the *amount* of land to be taken, but were not concerned to oppose on other grounds.

The Minister's inspector supported the local authorities' views in principle, though extraneous reasons compelled him to recommend against the application as then put forward; he specifically recommended, however, that this should not stand in the way of a fresh application when certain other matters had been resolved. But the Minister did not accept his inspector's recommendations*, thus overriding the opinion of three sets of elected representatives and his own quasi-judicial officer. What kind of democracy is this? To anyone who has climbed the heights of Upper Teesdale (reservoir or no reservoir) to the strange depression in the Pennine chain known as High Cup Nick, from which to look down on the delectable valley of moorland, farm and woodland, where this horror was to be sited, an excellent kind of democracy. But can the local people, wanting jobs for themselves and their children, be expected to see it like this?

* In 97% of the cases the Minister *does* agree with inspectors' recommendations.

In situations of this kind a great many interests are in conflict, and not all of them show above the surface. Some people find noise, litter and mass enjoyment acceptable; others, maybe a small minority, find them intolerable. Some put employment and family security above all else, others want to preserve a vanishing countryside, some of them having reasons just as sentimental, selfish, or, if in the tourist trade, financially hard-headed as their opponents. Conflicts of this kind come into the open at local inquiries, but in the background are conflicts of another kind which must eventually be resolved by political decision. The people of Westmorland, or those who want to preserve Westmorland, see the problem as it affects Westmorland. The Secretary of State in London has got to consider how much scenery, or history or wild life (to say nothing of agriculture) there is in the country altogether, and to weigh up not only the arguments which are filtered through his inspector but the views of the national electorate as well as the effect on posterity, who can only inherit what this generation leaves to them. For "Whitehall" is not mindless of this ultimate responsibility. In rejecting everybody's advice the Secretary of State, also indirectly chosen by the electorate, may be fulfilling a democratic role as conscientiously as the local councils are fulfilling theirs.

The fact that the public inquiry is now a means of public participation in planning is due to the way the public has taken hold of a legislative provision and turned it into something that it was never intended to be. The intention of Parliament was to give an opportunity to a very restricted group of people, personally and immediately affected by a proposal, to state their objections. By a distinction of theological subtlety, objection was to be confined to the plan and was not to extend to the policy behind the plan; third parties, which includes the entire amenity lobby, had no rights, and indeed have none to this day. All this was made clear in the evidence given by the Ministry to the Franks Committee in 1957. But since then public opinion on the environment has gathered such strength that it has simply rejected the purposes of the Act and substituted its own, so that fine distinctions have ceased to mean very much and everyone who has anything to say is allowed to say it. Third parties still have no legal rights* but are accorded generous opportunities by administrative concession. Frequently a Minis-

* Except in a limited number of so-called "bad neighbour" developments, where offensive smell or noise may be involved.

ter is not obliged to hold a *public* inquiry at all – his statutory obligation stops at providing “an opportunity to be heard by a person appointed by him for the purpose” – but almost invariably prescribes a public inquiry. In other cases he is only obliged to hold an inquiry of any kind, public or private, if objection comes from certain public authorities; private objectors, including amenity societies, have no *right* to a hearing. But a public inquiry is not refused either when public opinion has presented organised and representative opposition, or when an objector, influential or not, has raised a point that had not previously been considered. The Secretary of State is concerned only with the *quality* of an objection.

This change in the scope and purpose of public inquiries, with no corresponding change in statute law, is a remarkable example of how organised public opinion can influence the process of administration. An opportunity to justify an objection to a proposal has gradually developed into a discussion of the need for it and criticism of the manner in which it is being satisfied.

A corollary of this change has been that planning inquiries have become public debates, and the Planning Bar a prestigious branch of the profession of advocacy. This has not always worked to advantage, for it has tended to make public inquiries too much like the courts. Procedural rules for inquiries are admittedly much simpler than court rules, and the inspector, unlike a judge, can take into account the evidence of his own eyes when he visits a site. But too much is heard of “evidence”, and many important matters are not put in evidence at all. For example, the decision to permit a natural gas terminal on the Norfolk coast may have been justified in itself, but it did not take into account – there was no evidence – future developments which might mean that it had to be extended to an unacceptable point*. Or again, although inquiries are fair and inspectors are widely praised for their discrimination and impartiality, it is undeniable that wealthy and articulate interests have an advantage over others. Even today the strength of the pro-airport factions at the London Airport inquiries is not known, and it is doubtful whether justice was done to it in evidence.

Accordingly there has been a tendency to supplement the

* This actually happened. A 175 foot high chimney, expressly excluded from the Minister's planning consent, had later to be erected.

“adversary” procedure of the British courts with the “inquisitorial” procedure of a Continental examining magistrate. The Roskill Commission, for example, although it listened to lengthy advocacy, was also free to range wherever it liked in search of information – within its admittedly limited terms of reference; and there is a (so far unused) provision in current legislation for a “planning inquiry commission”, with powers somewhat resembling those of Roskill, when the proposal that is to be examined raises new or difficult scientific or technical problems, or when “considerations of regional or national importance” are being raised. One of the most common difficulties about public local inquiries is that what they are discussing is not really local.

Meanwhile the Development Plans, with which we started, have also run into difficulties. The public inquiry into the Greater London Development Plan, which started in October 1970 and is still going strong, is a test of physical, intellectual and financial endurance, and this is made more burdensome by countless individuals and groups repeating one another, or taking up the Panel’s time with matters which must inevitably be regarded as minor in the context of the Plan as a whole. So now the Government, with an eye on the spate of Structure Plans which may be expected in 1972 and 1973, are proposing to give the Minister power to be more selective in deciding to whom he should listen*.

There is another problem here. We seem to have elevated a largely discretionary provision in an English Act of Parliament to the status of a fundamental human right. Is it essential to our kind of democracy that everyone shall be able to come to an inquiry and say what others have already said? Can we not distinguish between “evidence” that is a statement of personal grievance and that which is a contribution to a solution, and should not the two be dealt with in different ways?

This is only part of the larger problem of adapting the way we conduct major planning inquiries to the complications that they now encounter – complications scarcely imagined by the Franks Committee when they first took a long look at “administrative procedures which may involve a public inquiry” fifteen years ago. In some respects the old 19th century Private Bill has advantages, and in a recent case it was more favourable

* Town and Country Planning (Amendment) Act 1971, section 3.

to the objections of the protection lobby than was a comparable public inquiry*. But no-one would claim that participation was among its virtues, for only those who can afford to brief parliamentary counsel can get a hearing; and so far no-one has been able to suggest how to improve public inquiry procedure without prejudice to the individual rights we have come to take for granted.

Perhaps the public hearings of the Roskill Commission may have provided a clue, for they mixed up the "adversarial" and "inquisitorial" elements. Learned counsel spoke on behalf of their clients – the objectors – but from time to time members of the Commission, themselves expert, addressed questions direct to expert witnesses, whose language they understood better than counsel who were attempting to interpret it. The Commission thus combined hearing objections with getting at basic facts.

It might be better if expert were to speak to expert, whether in public or private, in order to clear as much ground as possible *before* objections were considered, though it could be obligatory for them to consider written representations from any quarter. Public inquiries, hearing both objections and counter-proposals, could then follow the publication of their advice, objectors having to satisfy a credentials committee either that they represented a substantial organised interest or that their objection or counter proposal had not already been taken into account. This would be less than democratic, as the word is commonly used, but it might be better to be undemocratic than to seize up, and we would still be giving people more of a say than almost anywhere else in the world. The Department of the Environment may be a bit authoritarian, or paternalistic; but no other country in the world goes to half the trouble. Foreign visitors to the Council on Tribunals are dumb with astonishment at the way the public is pampered!

The trouble with planning controls is that their success lies in what has not happened, and what is therefore not easy to demonstrate; the failures, and the bad cases that have been allowed to slip through the net, are all too obvious. But planning legislation in general and the public inquiry in particular have arrested a potential slide into squalor, and have given the public a fair chance both to participate and to protest – at

* A proposed reservoir in the Calder Valley (private bill) was rejected by Parliament but a power station in the Snowdonia National Park (public inquiry) accepted by the Minister.

least, where local planning authorities have played their part properly. And below the mountain peak inquiries into airports, motorways, power stations, reservoirs, and mining and drilling operations there are, in the foothills, a score of inquiries taking place every day of the year into footpaths, garages, filling stations, turning houses into shops, unsightly advertisements, preservation of buildings and a dozen other matters. They represent thousands of hours of patient investigation in which claims are delicately balanced – those of the individual against the community, of commercial progress against aesthetic preservation, of short-term benefit against long-term advantage. Without them the quality of our national life would be a good deal more depressing than it is.

Ronald Wraith

The Green,
Widdington,
Saffron Walden.

Sentences: *Gloucester Moors.*

William Vaughan Moody

A mile behind is Gloucester town
Where the fishing fleets put in,
A mile ahead the land dips down
And the woods and farms begin.
Here, where the moors stretch free
In the high blue afternoon,
Are the marching sun and talking sea,
And the racing winds that wheel and flee
On the flying heels of June.*

*Jill-o'er-the-ground is purple blue,
Blue is the quaker-maid,
The wild geranium holds its dew
Long in the boulder's shade.
Wax-red hangs the cup
From the huckleberry boughs,
In barberry bells the grey moths sup,
Or where the choke-cherry lifts high up
Sweet bowls for their carouse.*

* * * *

*This earth is not the steadfast place
We landsmen build upon;
From deep to deep she varies pace,
And while she comes is gone.
Beneath my feet I feel
Her smooth bulk heave and dip;
With velvet plunge and soft upreel
She swings and steadies to her keel
Like a gallant, gallant ship.*

* * * *

* Gloucester is on the coast of Massachusetts.

*God, dear God! Does she know her port,
Though she goes so far about?
Or blind astray, does she make her sport
To brazen and chance it out?*

*I watched when her captains passed:
She were better captainless.
Men in the cabin, before the mast,
But some were reckless and some aghast,
And some sat gorged at mess.*

*By her battened hatch I leaned and caught
Sounds from the noisome hold,—
Cursing and sighing of souls distraught
And cries too sad to be told.
Then I strove to go down and see;
But they said, "Thou art not of us!"
I turned to those on the deck with me
And cried, "Give help!" But they said, "Let be:
Our ship sails faster thus."*

*Jill-o'er-the-ground is purple blue,
Blue is the quaker-maid,
The alder-clump where the brook comes through
Breeds cresses in its shade.
To be out of the moiling street
With its swelter and its sin!
Who has given to me this sweet,
And given my brother dust to eat?
And when will his wage come in?*

*Scattering wide or blown in ranks,
Yellow and white and brown,
Boats and boats from the fishing banks
Come home to Gloucester town.
There is cash to purse and spend,
There are wives to be embraced,
Hearts to take and keep to the end,—
O little sails, make haste!*

*But thou, vast outbound ship of souls,
What harbor town for thee?
What shapes, when thy arriving tolls,
Shall crowd the banks to see?
Shall all the happy shipmates then
Stand singing brotherly?
Or shall a haggard ruthless few
Warp her over and bring her to,
While the many broken souls of men
Fester down in the slavers pen,
And nothing to say or do?*

William Vaughan Moody

NOTES ON CONTRIBUTORS

Irene Manton F.R.S., formerly Professor of Botany and head of the Botany Department at Leeds University, is a cytologist who pioneered the application of electron microscopy to the study of fine structure of plant cells. She is a gold medallist of the Linnaean Society, and author of about 150 scientific papers and one book, "*Problems of Cytology and Evolution in the Pteridophyta*" C.U.P. 1950.

Sir Frederick Warner is a consulting engineer, with special knowledge of pollution control. He combines industrial work around the world with chairmanship of a variety of Government committees. He is Visiting Professor at Imperial College, and at University College, London, in Environmental Design and Engineering. He is Chairman of Council in the School of Pharmacy and Vice-Chairman of Council in the Open University, and has just retired as President of FEANI, the European Federation of National Associations of Engineers.

Mary Osborn studied Physics at Cambridge, then decided she was more interested in Biology, and did postgraduate work both at Pennsylvania State University and at Harvard. She is now working in Cambridge.

Caroline Humphrey (née Waddington) took a degree in Archaeology and Anthropology in Cambridge and has done research at Moscow and Leningrad Universities and St. Anthony's College, Oxford. She is just taking up a research fellowship at Girton College, Cambridge. Publications: "*Some Ideas of Saussure applied to Buryat Magical Drawings*" (ASA Monographs X) and "*Simvolicheski aspekt v razviti buryatskogo zhlischa*" (Tezisy dokladov Institut Ethnografi an SSSR, Moscow, 1971).

William Davis writes poems and has been making an English Translation of the French poems of Thomas Merton, to be published by New Directions next year in Thomas Merton's Collected Poems.

Vernon Pratt turned to Philosophy after a false start in Botany. He went from Manchester to Oxford and now teaches at University College, Cardiff. Last year he spent in Nigeria at the University of Ife where he was Visiting Lecturer. His book (let) *Religion and Secularisation* was published earlier this year, but his serious interest at the moment is in the philosophical issues in Biology.

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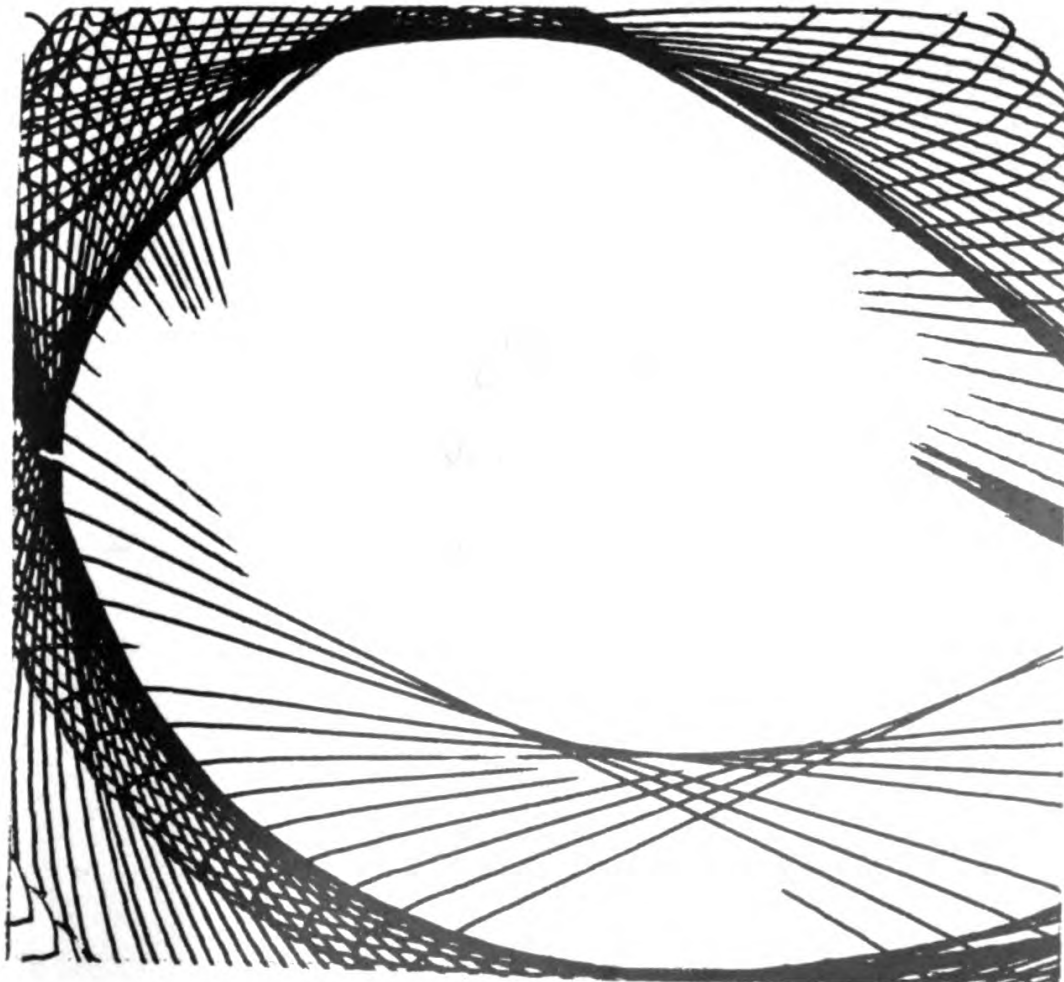
Ronald Wraith C.B.E., has recently completed a book ("*Public Inquiries as an Instrument of Government*") for the Royal Institute of Public Administration. He was previously concerned with public administration in developing countries, at the L.S.E., the Universities of Makerere and Ibadan, and the Institute of Local Government Studies at the University of Birmingham.

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" . . . every moment is the best of all opportunities . . . "

Old Buddhist Adage

KARLFRIED, GRAF VON DURCKHEIM formerly Professor of Psychology and Philosophy at Kiel, has for the last twenty years run a centre in the Black Forest where he has developed psychotherapeutic methods for healing and deepening the 'spiritual' life. His methods, incorporating his knowledge of Yoga, Zen and Western practice, are unique in using the routines and activities as perpetual opportunities to practise the 'Way' and, indeed, as spiritual exercises in themselves. Available, since 1962, in German, French, Dutch and Spanish, the book describing his methods has been translated into English by Ruth Lewinneck and P. L. Travers as

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THEORIA to theory

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Editorial

Mary Glover's article "Mad Quakers", on the origins of the Retreat (the Quaker mental hospital in York) comes to us at a time when there is general dissatisfaction with the treatment of mental illness, from the Department of Health down. The report on Whittingham near Preston is only the last of a series of shocks over what can go on in huge over-crowded, understaffed mental hospitals. Sir Keith Joseph has said that his Ministry's policy is to get rid of them over the next 15 years. Then the mentally ill will be looked after in branches of general hospitals or by what is called "community care". But how will this work out? The professional response is still not adequate, and that not only in terms of hospitals. As a reaction, we get R. D. Laing asking, Who are in fact mentally ill?, and saying that the trouble lies with our own social relations, into which some people (quite rightly, he says) are unable to fit. A challenge here, but too simple an analysis, ignoring the fact that bio-chemical imbalances may really be part causes at any rate of some of these mental conditions. Insofar as there is this kind of cause, research will probably go forward in the hospitals and new forms of chemical treatment be devised. What about the "community care" side? How is this going to be carried out on an enormous scale?

The Retreat was a pioneer voluntary effort, started not by professionals but by people guided by love and imaginative good sense at a time when professional theory was in the dark ages. It may not now be quite in the dark ages, but it is still a long way from clear civilized enlightenment. But there may be hope for "community care" in the fact that new kinds of spontaneous voluntary efforts are bursting out among people ready to improvise ways of working among those whom society generally wants to push out of sight. The Cyrene Community is a notable example. 70% of those who come to its Cambridge house are former patients of mental hospitals. They are given a base by people – most of them young – who spend their time and life energy in this voluntary work at grass roots. They badly need to know how and when to bring in professional help, and the professionals need to appreciate these heroic unorthodox efforts.

These are efforts by people very many of whom strongly repudiate any suggestion that they are acting from "Christian love", which they associate with "do-gooding". Damaris Parker-Rhodes calls

attention to this in the Discussion on Buddhist Meditation in this number, and Derek Wright's remarks in this same Discussion show that something has gone seriously wrong with the image of Christian love. He associates it with a self-conscious and even self-centred cultivation of an attitude. Is this what can happen when Christian love gets cut off from its contemplative root?

Yet what the world needs is a union of love and insight, and both Christianity and Buddhism are concerned with this union. But it looks as if they approached it from different ends. Christianity starts from an emphasis on love, and tries to see how our particular loves can develop in the ambience of a non-possessive, appreciative love (the "love of God"), and it says that insight can grow out of this. Buddhism starts from the cultivation of detached insight, particularly into oneself, and says that out of this an enlarged compassion towards all creatures can grow. On the Christian side the emphasis on love can go to the bad unless it is joined with genuine efforts to think and to acquire skills. These can show themselves in the imaginative practical good sense of a host of quite simple people. At another level they can produce what Lindsay of Birker (whom Mary Glover quotes at the beginning of her article) called "the scientific mind in the service of the merciful heart". Where this has been achieved, as in the development of medical work, this has been Christianity's gift to the world. But love alone cannot produce intelligent insight, and in some cases may even be blind. Where the Buddhist side can go wrong is if the emphasis on self-observation can weaken spontaneity, especially in straightforward personal care for people, and also weaken the concentrated, and individual, involvement which may be a necessary stage in some kinds of love-inspired creative work. Mary Glover's remarks on the different kinds of love and their respective strengths and limitations bears on all this, and also on how the union of love and insight can feed professional therapeutic skill.

Loving and intelligent observation certainly went into the work of the author and Landscape Architect Nan Fairbrother. We are printing a review discussion of her latest book "New Lives, New Landscapes", and we had intended to do this before we heard of her death last November. Those who knew her when she was dying of cancer have spoken of how she went on working, not in stoical resignation, but with almost amused detachment from her own illness. T. to T.'s contribution to the debate on "Conservation and all that", which goes on all round us, is to keep alive the general theme of looking at possibilities of using technology not to mess up

but to enhance the environment. This was certainly Nan Fairbrother's approach. She had been brought up in a back street house in an industrial town, and had spent the war years – what she calls “rubber-bootless years” – looking after her small children in a mud-encircled farm cottage. So she had no illusions about the romantic and the “twi”; she saw that those who have to live and work in the country need efficient methods and good standards of comfort. Yet she also saw the beauty of established towns, of industrial landscape, of agricultural landscape, and of wilderness, and wrote on how we should conserve the special excellences of each. When we have a review discussion of a book, we normally ask the author to reply. As this is not now possible, we are giving some extracts from the book as our “Sentences” at the end of this number. There is a poet's vision as well as hard practical sense in Nan Fairbrother's writing, and we believe that it stands up to having Sentences selected from it not just in default of a personal reply, but in its own right.

* * * *

The cover design was produced by D. P. Henry (see “Notes on Contributors”), using a modified analogue machine he has constructed.

Discussion: *Three Westerners talk about Buddhist Meditation, Freda Wint, Derek Wright, Damaris Parker-Rhodes*

Derek

Now you, Damaris, have adapted Buddhist meditation to the Western tradition of Quakerism, and you, Freda, have gone right across and become a Buddhist. For me the main function of the practice lies outside any religion. Now how can you in fact defend the need to embed the practice of meditation in a religious tradition?

Freda

The answer is quite simple in my case. When I first tried this practice it struck me as so dynamic that I wanted to find out what lay behind it. I began to study Buddhism because I sensed that meditation is only part of a much wider system and I wanted to discover what this was.

Damaris

That is just about the point of view I hold. Meditation for me was a matter of mind culture to help me to develop. I came in from the point of view of Quakerism and didn't feel any need to come away from Quakerism.

Derek

Yes, but I can't see the *need* for a religion. Meditation is a kind of psychological practice which is something that you do, and the doing of this is the same whatever kind of belief system, whatever kind of metaphysic you adopt: the effects it has on the human system are lawful, and the same wherever you go. And it seems to me that the really important thing is not to get trapped within any particular set of religious or metaphysical beliefs, but to disentangle the practices themselves from all religious systems: and the language you use to describe them will be your own language.

Damaris

As soon as you say that, I see that my Christian language, and indeed other languages, are channels by which we reach places in ourselves which otherwise would be hard to reach. Due to medita-

tion, I find all my Christian symbols are in quotation marks. But I'm interested also in feeding the hungry and clothing the naked, and I find my Christian symbols help me to do that.

Derek

Now you're bringing in a way of living. I was thinking of meditation a bit more narrowly as a kind of practice. The practice itself as I understand it is intended to bring you to the point where you cease to conceptualise altogether. This is repeatedly said in Zen and other writings. Now I would argue that it is more difficult to break through into thoughtlessness from some languages, and I reckon that the Christian language is one of them. It is such a rigid, encrusted sort of thing with so many emotional associations. It is very difficult for people to break through.

Freda

Any religion is.

Derek

The only reason I like the Buddhist language is that it seems to a Westerner to be less full of encrustations. There is something to be said here for arguing that the best sort of language is precisely not the one you've been brought up in. The language of your own culture is much more likely to act like a scaffolding which you can't abandon when its function has been achieved.

Freda

But I don't accept that the aim of meditation is to stop conceptualising. That's one of the exercises, I agree, and a very important one, but I think it is a mistake to fall into the habit, as people do sometimes, of regarding the power of the brain to conceptualise as something we want to do away with. If meditation practice were wrongly used for a very long time it could undermine mental functioning, as mental laziness can. But properly used it shouldn't. One must keep one's ability to think, but one is instructed to watch it. The psychological aim is to watch each function of the brain – conceptualising is one of them, the free-running activity of the brain is another – but not to injure them or to stop them for good.

Derek

Yes, I accept that. Meditation is like a concept-less awareness of conceptual functioning; nevertheless, when you practise this it is the

case that you tend to reach a state of great quietness, when there is minimal thinking going on, when the system is very, very still yet you are very wide awake and alert. Whereas the impression you gain from certain yogic exercises is that they seem to be intended just to shut out everything, and suggest that the goal of the practice is to turn you into a sort of vegetable.

Freda

Yes, that seems a bit extreme. But at the same time there is a sort of noble folly about the more completely committed kinds of yoga. They maltreat the body in order to storm the gates of knowledge. There's heroism in it. But the Buddha, who tried it, is said to have given up the practice of extreme asceticism as being unbalanced.

Derek

I think what I would want to say is that when people practise meditation and become aware of their processes of thinking, believing and arguing, the effect is an awareness of the relativity and the social determination of their thinking. And the practice of this awareness tends to make you sit loose to the very tradition of thought from which you started. It's like moving outside it.

Damaris

I think this happens with anybody in any tradition. I think a point came, for me at any rate, where I had this person standing outside myself, watching me in Labour Party management laying down the law, and the person was smiling. This first undermined a great many of the things I was doing because they were an ego-trip. And as for the dogmas of Christianity, one saw so clearly that they were simply symbols, and indeed the point comes where one feels completely lost, one is in fact no-thing, one is nothing, and this is an extremely uncomfortable position to be in, a point of being completely undone and disintegrated. Out of that came the further experience of seeing that to be no-thing was a nice thing. And what was so interesting for me was that from that point the personal, so to speak, flowed back : as I was wanting to be used for meaning, if there was any, I found that because I was a Labour Councillor, I would go and knock on somebody's door at one o'clock to collect the Labour Party subscription and wonder, "What on earth am I doing?" and then find that the mother was dying and the district nurse was in, and they couldn't tell the boy, and the nurse fell into my arms and said "Thank goodness you've come, and will you tell him?" That sort

of thing kept happening, and out of a feeling of complete personal-lessness I began to see that the Jesus of the Evangelicals and the Good Shepherd and all those symbols seemed so intimately true. The personal came in again by a back door. So that every day now as I go into meditation, I dedicate my day to the powers of good, and I understand these symbols in the most personal way.

Derek

The fact remains that both of you are staying within a particular tradition. You are, if you like, religious people, and you have religions. I can't see how you can stay within one tradition, if the very practice you engage in makes you increasingly aware of its relativity. It seems to me that religious traditions are to be picked up and played along with, just as long as they are useful, and no further.

Damaris

I'm happy to hear you say that, because it seems to me that the "God is dead" theology is fine in so far as it means that man has got to take responsibility fully. But when you take responsibility fully, maybe you would say that you have found, as I have, that as time goes on there is a loosening of pieces of potential within yourself of an intuitive kind; there is something much bigger than yourself, a piece of wisdom which by yourself you don't have. In all sorts of writing and speaking that I do, I get taken hold of, and this is something that I put my hands together and pray about, and I say "Christ in me" or some such phrase. But I don't quarrel with you, it's just that I think I'm using different terminology.

Freda

May we now attack you, Derek, on this point? What has been the result in your life? Do you find yourself sitting around doing nothing because you have reached the stage of stillness in meditation? Have you given up a whole past system of belief in the worthwhileness of action, for instance, and the educational work you do? If not, how can you justify that? Damaris has just justified her keeping on with Christianity.

Derek

Well, there are two levels in this. I was talking about belief in a particular religious tradition. If you ask a question about me personally, I think I have become increasingly aware of what I want

to call the cosmic laughter, and the fact that all one's actions become seen as a part of the dance which goes on, and it is a rather marvellous dance to watch, but what I do is not of much value within it – the total dance goes on.

Freda

But this is a religious way of looking at life.

Derek

Oh, I wouldn't deny that. All I would deny is being stuck with any particular religion.

Freda

So in fact, you don't deny the value of religion? You started off by saying that there were the three of us, two of us religious and you not religious, but you've gone back on that point?

Derek

I didn't say I was not religious, I said I wasn't attached to, or involved in, any religious tradition.

Damaris

Look, you seem to be all in one piece. That's nice for you. I want lots of structures as well. I have done a lot of work with the Simon Community and the dossers, and when I've got somebody who's just hurled a lot of things and is going to attack us again, and we've got five minutes to spare, I go down on my knees in the kitchen, and I say "Quick, Lord, show me what to do" whereupon at this quite childlike level I receive power, and go out with a cup of tea for him. At that moment I've gone straight back to when I was about six, and when I come back I think, "Well, that was funny. I don't really address Jesus like that." And I see that I function on a number of levels. You are just much more grown up than I am – you can function on one level. I like something that lambs can paddle in and whales can swim in, and I recognise that I do.

Freda

This is probably significant, this harking back to childhood. The point is, I think, that you and I, Damaris, have been brain-washed, and I think that this brain-washing is very valuable, provided that we know that it has happened to us. You were brought up in England as a Christian, and I was brought up in India, and had Indian nurses who would show me temples when we were out

walking and tell me stories, which probably accounts for the fact that I find it natural to believe in re-birth and many spheres of existence and many beings inhabiting them. I had a letter from a prisoner some time ago which said "My cell is full of glory. And I ask myself 'What's it all about? What's behind it all? It's God, and God is glory and intelligence'." He hadn't been a believing Christian for years, but later it came out that he had been brought up as a Catholic. Give me a child until he is seven . . . Well, I lived in India until I was eight years old. As a result of meditation practice we can see that religious imagery has been implanted in us, and obviously we would not have missed the experience for worlds. Like you, or my prisoner friend, I find it a ventilation shaft through which light comes down into dark corners. The imagery I received was Hindu, and Buddhist imagery sprang from the same source (though the beliefs diverged in very important respects) and I still find it moving.

Derek

If you really are fully aware of the nature of this brain-washing, if you can see the sources of your attitudes and feelings in your society, so that you can see yourself as the product of the context in which you happen to be, then I would have thought you would have grown through and be free of that particular tradition. There is psychological evidence that meditation is a very potent practice, and that it tends to de-condition you. Although in meditation one is trying to reach an awareness of what is going on without interfering with it, that very awareness in fact shapes and changes what's going on. If meditation really is a personality-changing practice, then there is no escaping the fact that you become in some sense free of your previous conditioning. The more aware you are of the process as it's happening – the stimulus producing an affective response in you, the total process going on – to that extent there is less identification with the feeling or process.

Damaris

Oh, I don't agree. I think a point comes where you think you've lost all your symbols, and then a point comes where, with great delight, you see them as incredibly real, and written right down into nature – you can't look anywhere without seeing them.

Freda

Do you think that liberation in the face of tradition could give one

the power of using that tradition in a new way, not just because one has been conditioned into it, but by really being able to see what may be creative and potent in it, and that one needs a tradition in order to think like that?

Derek

I think there are two things here. One is that you would end up not needing the tradition at all for yourself, but the other is that you would end up with a very clear idea of how the tradition works, and you might therefore be able to help others within the tradition, or use the tradition in relation to others in such a way as to be able to understand them better, but I don't think it would be of any use to yourself. My limited experience of people who have meditated a lot is that when you meet them, the sort of words you want to use are words like "cool" "still" – for good or ill they don't seem to have all these strong, affective responses. In fact, one of the things that the practice of meditation seems to teach is that your affective response is unimportant. Nothing follows from it. It is just the system reacting in a certain way – so what? What you become is much more objective in the sense of situation-centred, rather than ego-centred in the situation.

Damaris

No, I think we can become much more love-centred. It may be my tradition making me say this, but I'm interested because my teacher said to me on one occasion "You know when you Westerners have a breakthrough in meditation, so often it comes as *mettá*" – which is the Pali word for love. "This is more usual with you in the West than it is with us in the East," he said. It seems to me that this is partly because we have been rooted in a particular tradition where this has been the central thing, and therefore when we have a breakthrough in meditation it tends to come that way.

Freda

We'll come back to the question of love, but may I just bring up a point here, about conditioning? Isn't it generally accepted that the ability of human beings to be conditioned is an important fact in producing a good and stable society?

Derek

Of course you're right. We have to go through a long period of conditioning if we are to become moral and social beings. It is the

effect of meditation upon such conditioning which interests me. Can I take an example? Somebody says something aggressive to you, and as a result of all sorts of conditioning you respond with anger. The effect of meditation is increasingly to make you respond with something closer to vestigial anger, and if you are aware of what is happening, what you would be aware of is this little vestigial anger response in you, and that response would just be a fact of the situation and would in no sense determine what you did. So you would actually act in terms of what the total situation might seem to require from you, which might be apology, or which might be to say nothing. The effect of the meditation would have been considerably to de-condition you, so that the anger response is a tiny set of vestigial sensations in the system from which nothing necessarily follows in terms of action.

Damaris

I want to say something about this. I suddenly found on practising meditation that I came face to face with my passions, and then the daemonic “mine is the kingdom” and the charismatic “thine is the kingdom” rose at the same time, and I was confronted with the knowledge that I could do the things that happened at Belsen. I could murder people. I had incredible angers and wraths and these I had to recognise as mine. It took me two or three years to get the better of this frightening thing and to get to the point where I could watch my angers arising.

Derek

In the Eastern way at any rate the practice of meditation consists in observing yourself without comment, and one of the things you are observing is this bit of you that is constantly evaluating yourself and others. The effect of this is, first, that you decreasingly pick and choose in the processes going on in yourself. (I don't know what consequences this may have for morality). Secondly, the responses in you – the anger responses and the love responses, as affective responses – tend to cool off, which leads me to say something that never gets said by any of these people who write about meditation, and that is that there is a developmental aspect in this. I think that the meditation practice becomes especially relevant only when you are middle-aged or older. In the early part of life it is appropriate to be committed single-mindedly to work tasks and achievement goals, to be passionate in relationships and causes, but in the second part of one's life one ought to be moving towards the

sort of effects meditation can have – that is, serenity, a kind of disinterested wisdom and understanding and a sort of economy of action.

Freda

Looking at it from the point of view of the laity, who live and work in the world, I agree about this, and it was exemplified in the Indian tradition. One notices, by the way, in some of the old accounts of the Indian disciplines, in the Upanishads for instance, or in the Tibetan Buddhist schools, that they prescribed a great deal of secrecy – they veiled the method and made it difficult to approach. Presumably they meant by this to keep it away from people for whom it might be damaging – and I agree that this can be the case with the young. I think there is some evidence to show that if people take to meditation intensively too young (unless it is in the stringent conditions in which it is practised by young monks under an instructor) it can become difficult to be conditioned, including particularly voluntary conditioning of oneself, in the direction of a positive and creative way of life. In the Hindu system these things were carefully worked out. You went through your stage of study and adaptation to your culture at adolescence – they called it the *brahmachariya* – then through the stage of a householder, which involved you in work in the world in the normal way, and only after middle age did you take up this intensive kind of practice. All the stages were regarded as vital for wholeness, and the effort you put into one lit up possibilities in the next.

Derek

But since the invention of printing and modern methods of scholarly research it is difficult to keep teachings secret any longer: in fact now we feel it goes against the grain.

Freda

And it doesn't mean of course that one shouldn't practise meditation at all when young – there are some kinds of practice which the young can do particularly well, and which are much harder to manage later. But there is a question of keeping a balance: growth periods are so delicately adjusted. But looking at another side of it, there is the fact that occasional religious geniuses crop up who develop full awareness in early youth. And there are others, who might be described as specialists, who take up the training early, and become monks or teachers. Part of what these people are doing

is studying along traditional lines which are aimed at making them able to hand on practices to other people without putting too much subjective interpretation into them.

Derek

Here I'd like to go back to the question of love, which we touched on earlier, and how it is affected by the alterations in functioning which meditation practice produces. Now I have a rooted objection to Christians talking about love. They *believe* in love. The people I've known who have really seemed to have lived it, never talked about it. They didn't believe in it either. When Christians talk about it I get the impression that it is part of a self-development programme, that they have a kind of sanctity ego-plan in which love happens to be the main means of becoming a saint. I think you will agree with me that people really begin to love when they forget all about whether it is a good thing or not.

Damaris

I think it stops being as hypocritical as you make it sound, because in fact as one learns even quite a little, one sees that almost everything is an ego-trip, and then a point comes when you say "All right, it is. All right, we walk forward." That's what Christians call stepping into the forgiveness of sin. Look, – a great many young people, whom I meet in the Cyrenian Community work, with the dossers and the down-and-outs, say "We don't do this because we want to do good – to do good disgusts us – we want to do it because it is a product of the way we live. We need to do this in order to feel alive." You see, there's just nothing you can do in any direction which isn't an ego-trip. Everybody's like that too, and you step from that into going ahead.

Freda

Could I bring in a point here? It's something to do with the different systems of belief in the different religions. I think each of the great religions had some specific spiritual point to make. Judaism and Islam had monotheism, which was their great creative discovery; Buddhism and Hinduism in their different ways pursue release, or as they sometimes call it, wisdom; Christianity brought in this concept of love. It had been known before, I don't deny, but not as the central theme of a great faith. It strikes me as natural that when Christians talk, they should talk about love.

Derek

It's a great pity they do.

Freda

It may be a pity, but Buddhists talk about their schemes for arriving at wisdom in ways that can be just as incongruous. Muslims on monotheism can generate enough heat to spark off a religious war. Surely a real interest in one's belief tends to express itself in various forms in one's life, and talk is one of them. In fact Christian love is the great contribution to humanity of Christianity.

Derek

You leave me speechless.

Freda

I was impelled into a platitude. But look how many altruistic systems in Christendom sprang out of the impetus of Christian love. They must have been planned and talked over.

Damaris

The pattern of the holy man in the East and in the West is in fact quite different. The pattern of the holy man in the West has always been the man who stood for feeding the hungry and clothing the naked, and compassion at the deepest level. And in the East he lives in his temple, and the world comes to the temple to be renewed. But he doesn't go out into the towns like Mother Teresa in Calcutta. Christianity is a religion for activists, and Eastern religion is the *via negativa*.

Derek

I'll accept that in general terms, so long as we never forget the wars and persecutions that Christianity has also inspired! But we've wandered from the topic a bit. Could we get back to meditation again. If you are to be maximally aware in a situation, so that you act as the situation requires rather than as you personally want, then strong affective response only messes this up, only narrows you down selectively on this or that, only pushes you into one sort of action rather than another. So, situation-centred behaviour seems necessarily to imply an affective coolness. You need affective responses – vestigial ones – but when they are strong they produce biased, egocentric action in you, they narrow attention down, and

they are disruptive. This being the case then, what happens to the capacity to love?

Freda

But this state of diminished emotional reaction is specifically recognised and compensated for in the method as a whole. You are really talking about the “insight” meditation practice when you refer to lowered affective response – isn’t that so? This is balanced by what are known as the *mettá* meditations, which are directly concerned with the heart and the emotion of love. Now here again, of course, Buddhists are all of a piece. Take personal love, for instance; when I first met the fourfold teaching on love in Buddhism – where you develop love, and then compassion, and then sympathetic joy and finally equanimity, in an ascending scale, the highest point being equanimity – I was startled and felt that the cultivation of this degree of detachment from people was rather cold-hearted. But, in fact, as we begin to realise that the equanimity is not passivity, but is a higher function which contains the other three within it, then I think we can recognise its power.

Derek

I still bother about detachment. When talked about it sounds so bloodless – to be without preference for A over B, or B over A, or other over self – a neutrality raised to the level of absolute. But I suspect that what can’t be conveyed by talk is the fact that when that kind of state is reached all people become invested with delight, and the absence of preference means an absence of holding on, and an absence of holding on liberates creative action in regard to them. And presumably absence of preference does not alter the fact that it is easier to get on with some people rather than others.

Freda

That is a matter of affinities, isn’t it? As human beings we have natural affinities, as we are born with one disposition and not another.

Damaris

My view is that meditation does clean out the passion of love and brings it down much more deeply into your being so that you love in a much truer way, and this is particularly so of sexual love. The obsession of love gets gradually cleaned out and the point comes where you can love safely – this is enormously relieving. You are

no longer afraid of being swept away by obsessions. Then there comes a much deeper communion with everything : you can accept people as they are, and from this comes the deep healing charity which is the centre of Christianity, but is also a part of Buddhism and I should have thought of all the great religions.

Derek

Anyway, the effect of meditation is to produce a change in your functioning. You don't intend to produce one – it's a by-product of trying to watch what's going on.

Freda

And the change is in the direction of stabilization. Isn't this all rather analogous to the system known as homeostasis? I mean, we have this ingenious self-regulating mechanism which controls things like body-temperature and blood-chemistry and so on, in a lowly, primitive part of the brain, which we don't consciously notice as a rule, and this leaves the higher brain free for more interesting tasks, like thinking, for instance –

Derek

“Higher” brain?

Freda

It's all right. I wasn't implying anything extra-cranial! At least, not so far. But next, when we come to practise meditation, we find that the same sort of stabilizing process takes place, only this time it is in the higher brain – or cortex, if you like – where now the thoughts and imaginings and emotions are stilled, and the mind is left free for the next leap, which in Theravada Buddhism is called insight, and in Zen *satori*. And this comes naturally, so we are told, not by straining after it for the sake of the goal of insight, but simply by watching the body and mind.

Derek

Yes, and curiously enough, the attainment of stillness is achieved in the first place by watching some of those parts of the system which are kept functioning by homeostasis, and which normally, unless they are out of order, we do not observe at all: such things as heartbeat, muscular feedback, the respiratory system, and so on. The awareness is spread to all aspects of functioning, and, as we said earlier, the cognitive process is observed too. Furthermore, the

idea is to make this awareness a permanent condition – so that for example the individual is aware, finally, of his system sleeping, and therefore does not in the ordinary sense sleep at all.

Freda

One notices that as soon as one is introduced to the practice, one seems to need much less sleep, and yet the sleep one has is unusually refreshing. That is, when one is doing the practice properly. One slips back, unfortunately. But apart from useful side-effects, like improved concentration and refreshing sleep, it would be interesting to hear what you have to say about the metaphysical implications. You've told us that you stand outside traditional formulations, but surely you will admit that there are factors outside the mere watching of one's circulation or one's breathing?

Derek

Well, since you corner me, yes, I suppose there are metaphysical implications. It seems to me that, in terms of development, the task from adulthood onwards is this very one of lighting up the whole system with awareness. And since the system is what its past has made it, since it embodies the steps and stages it has gone through – so therefore, by extending this practice, one's past comes alive in the present. And one can go further: we are also what our environment and heredity have made us. So it is ones very environment and heredity which is becoming aware of itself in one. At this level, it is not really the individual who is becoming autonomous, but the total person-in-context which is. And beyond that, perhaps we must climb up out of all the psychosomatic forms of awareness into unity with even the inorganic.

Freda

That is a statement about mysticism, and what is interesting is that it also seems truly and particularly your kind of mysticism, your "way" so to speak.

Derek

Statements about mysticism are like throwing up a fountain of words. They all fall back down again. You can't climb up them.

Freda

Very well, then. To return to the business of climbing. How does morality fit into all this?

Derek

If you mean by morality, rules proscribing this, or enjoining that, I think its value is limited. If you have a set of conscious rules, and you keep them, you know you have kept them, so you are trapped into self-righteousness. On the other hand, if you don't keep them, the result is guilt. This is a whole process which all of us, in so far as we are committed to a morality, are trapped in. How do we avoid either congratulating or blaming ourselves? Now, the mystics seem to have broken out of this trap.

Freda

Could we say that an enlightened person is not exactly free of rules of morality, but he doesn't want to commit the kind of actions we regard as wrong? Buddhists think this arises out of a system of training, which began by being a gradual process once, and indeed we train our children in these rules, do we not?

Derek

I don't question that there are moral rules, and they have a real function, but I think being moral means more than keeping rules. I suppose you could sum up my feelings by saying that truly moral people agonise over things, and there are two kinds of people who don't agonise, psychopaths and the virtuous with their unquestioned rules. I have to see the end that moral codes are supposed to serve, and to see that they really serve those ends, before they mean anything to me.

Freda

People are thrown into dilemmas by the rule of morality, I agree : for instance, Eastern Buddhists try not to take life, and yet if we try to follow this example we sometimes find it is a difficult matter. It is difficult for a householder, for instance, who may be responsible for other people's food, not to take life if there is a plague of ants or mice. The act of killing causes one to agonise because one knows it is abominable. But it seems to me that we can't get out of this situation by abolishing the ethical injunction not to kill. Incidentally, it is very difficult to meditate if one is suffering from remorse.

Derek

You can meditate on the remorse. If you say to me "You need to have a clear conscience before you meditate", most of us would never start.

Damaris

Quakers, of course, are people who tend to bypass remorse. They don't go in for guilt at all, which is rather different from the rest of the Christian tradition. I think one of the things Buddhist meditation did for me was to bring me to right remorse, seeing how very self-interested was a very great deal of my action.

Derek

May I ask you a question, Freda? If in the Buddhist way (and I think we have been referring to the Theravada way mostly) there is a discipline, and there are stages carefully mapped out, and a conception of what you should be at the end of it, isn't this properly describable as a "personality self-programme", a training of yourself to be a certain kind of person, so that you can sit back and admire yourself?

Freda

I would say, first of all, that for a human being to undertake any activity whatever, he has to have some aim.

Derek

Yes, but there is something very special about this aim. It is "I becoming".

Freda

But one of the basic tenets of Buddhism is that there is no I.

Derek

So I sit down to devise a plan to get rid of my ego?

Freda

This is the most difficult concept to express. The Buddhist idea is that there is no ego, and it is a matter of seeing this.

Derek

Waking up to the fact that there is nowhere to go, that one is already there, that there is no ego?

Freda

This is the famous paradox of the text known as "The Perfection of Wisdom" – it is the aim of the Bodhisattva to lead all beings to enlightenment : there is no enlightenment, and there are no beings,

yet this is his duty. But in order to reach the state where you can turn on the light, of course you travel through the stage of being egotistic. Empirically speaking, we all have egos in our current state of delusion.

Derek

I can see the sense of this, not in terms of a training programme, but in terms of personal development. A young infant must develop a sense of self, otherwise he can't survive as a human being, and there must be a series of complex processes of developing through adolescence and career skills, and it is at a later stage that he should wake up to the fact that he is not really separated from continuity with everything else.

Damaris

This is the importance of the stages of development that the Indians outlined so well. There is the stage of individuation, and then the stage of seeing that one must lay it down, and be one with all. This is very interesting, particularly today, when you have great numbers of people fleeing from Western civilisation, because it is being too much for them, and the whole of their environment seems to them hostile and alien, and they can't link up properly even with their instincts, and therefore they tend to plunge out into Eastern meditation and also, of course, into things like hallucinogenics, so they break down the walls of the ego too early, and it seems as though there is nothing inside. All their drives are undermined, and they see no purpose, they stop their education, they don't want any kind of a career, a family seems to them a waste of time, and the whole thing goes, as it were, sloppy. One wishes they could have expanded all that piece of them until a point came when they were ready to lay it down, and to let wisdom come out.

Derek

You might say that by the ego we mean the way the personality is organised. And it has to be organised if its full potentialities are to be realised. What the meditation masters say is that we must grow out of, or through, our egos. But I don't think I am very well fitted to say what that is like!

Freda

We can all agree that we are in the same boat there. But it looks pretty clear that our separate approaches to meditation vary very

much. Damaris, you find that it helps you to see yourself functioning, but your inspiration comes from Christianity. And Derek, you meditate for some kind of personal private exploration if I've understood you rightly?

Derek

Yes, I suppose that will have to do as a description.

Freda

What I want to say now is that I think we ought to be clear before we finish that these practices were originally intended as a way of arriving at truth. It's not a proposition that would divide us in the last resort, I suppose, but our temperaments do seem to drive us along different avenues. The essence of the Buddhist system is neither in outward activity, nor in inner personal enquiry (though both these have a place in it). One might express it as a matter of inner objective enquiry. The Buddha made a handful of statements about the nature of existence, and then said "Investigate and see if it is not so." It was part of his way of approaching the inexpressible, and one of the reasons for meditation. The system of Buddhism includes some sort of attitude to these statements, some consideration of them. But that is another story.

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“Mad Quakers”

Mary Glover

There come times when it seems that social progress is held up for lack of what Lord Lindsay of Birker called social inventiveness; when prevalent forms of human suffering do not yield to any skills that have yet been discovered, and nobody can think up a new technique, or find out the causes of the suffering. These times contrast dramatically with periods when research is fruitful, invention successful and progress exhilarating. It is, of course, the same with science and with history and I suppose with all activities of the human mind. It is tantalizing that at some times diagnosis may be impressive and yet a cure cannot be invented; at other times a cure is stumbled upon and used with success before diagnosis has at all clearly revealed the nature of the condition that is being treated.

In our own day one of the afflictions that still to a large extent baffles both diagnosis and treatment is mental illness. Much progress has been made since Freud uncovered the unconscious and subconscious mind and diagnosis is sometimes convincing or at least plausible. Treatments have been experimented with and have yielded some good results, without any adequate understanding of why they should be beneficial. Experiment is lively, and there is hope in the air. None the less today we are all heavily aware of the great amount of mental illness or instability causing much unhappiness to many people, which apparently cannot be cured nor greatly relieved.

Two hundred years ago the general situation was somewhat similar. There was much concern about mental illness, and doctors were writing books about it, but such treatment as there was was traditional, based on the inculcation of fear as the basis of management and on old disgusting remedies. Asylums were not under any effective public control and there is evidence that this general situation released or even stimulated active sadism.

Then almost accidentally some Quakers in York were led in 1796 to found a mental hospital, the Retreat, which within twenty years had worked out a new “moral treatment” which attained fame. The experiment was written up by Samuel Tuke, grandson of the founder in his “Description of the Retreat” and published in 1813. This book came into the hands of the Rev Sydney Smith, the amusing worldly clergyman, who was a favourite at Holland House for his biting

comments on public affairs, but lived near York. He realised in a flash that madmen are news, and Quakers are news,* but mad Quakers are a first class scoop. He rode out to see the Retreat and wrote an article on it in the *Edinburgh Review* entitled "Mad Quakers"; he made two comments which are relevant here : (i) the Quakers "take more pains with their madmen than other people" and "the Retreat is without doubt the best institution for the insane that has ever been established"; and (ii) that it owed very much to the gifts of the staff, not least to their courage and "contempt of danger." On reading this I became interested in trying to find out what sort of people these brave Quakers were, and how they managed to invent new methods, which were in a high degree successful, in this field of mystery and suffering.

The Retreat has a fine collection of archives bearing on the early period of its life – letters, log-books, accounts, brochures and so on, and thanks to the kindness of the Directors and the staff, and to the fact that I worked there as an archivist for a time, I have been able to study these documents. The most valuable source, the "Description of the Retreat" was re-published by Dawsons of Pall Mall in 1964.

I shall outline (i) the rather unlikely succession of events which led to the foundation of the Retreat; (ii) the moral treatment which was gradually developed there and the theories to which it gave rise; (iii) and, in a second article, the relevance of this achievement to the experiments of our own troubled times.

The idea of the Retreat was born in York in 1792, in a house belonging to William Tuke, a tea merchant. It was a house in Trinity Lane where his wife ran a girls' school (the precursor of The Mount). The circumstances were that in 1791, a Quaker widow, Hannah Mills, had gone out of her mind and been brought by her friends to the York asylum; her own Friends' Meeting had written, as was usual when Friends moved from one place to another, to the York Meeting, asking them to look her up; they had tried to do this several times and been refused admission; and then Hannah Mills died. The Quakers were shocked. They had no evidence that she had been neglected or ill-treated; but they feared it. If you go to visit a friend in hospital and are refused admission, you may well come away feeling that the manner of the refusal has enlightened you to some extent on the spirit in which the hospital is run. While

*One recalls Charles Lamb's remark that thousands would turn out to see a Quaker hanged, who would be quite unmoved by the execution of an Anabaptist or a Presbyterian.

William Tuke and his family were discussing this, his daughter Ann (aged 24) said "Father, why cannot we have an establishment for such persons in our own Society?" The effect on Tuke was electric; he took up the idea and never dropped it. (The evidence for Ann's initiative is a Minute in the Monthly Meeting Minutes for 1850 of the Woodbridge Meeting, recording her own testimony.)

Tuke met with much opposition, first from his wife, who commented: "Your mind is always teeming with ideas but this brain-child is an idiot-birth". He put the idea to York Friends after the Quarterly Meeting in the spring of 1792. As his great-grandson D. H. Tuke tersely put it, "a wet blanket was thrown upon the scheme". All sorts of reasons were advanced against it. As a matter of fact, Tuke's style of argument put people's backs up, he was forceful and wanted his own way. The plan was as good as turned down. Then his son, Henry, a gentler and very charming character, asked: "But is there nothing to be said for my father's idea?" The Quakers never settle anything by majority vote, so the discussion began again. Eventually Tuke was told to prepare a scheme. There followed appeals to the Society at large and brochures; much criticism and very meagre financial support were elicited. A group of subscribers was formed. In 1793 this group decided to borrow a large sum of money and go ahead.

The question arises why Tuke was so dogged in pursuing this scheme against all discouragement and perfectly rational counter-arguments. I think that while Ann was speaking he was conscious of having received a monition of the Inner Light, and his loyalty to this never wavered. There are passages in his correspondence with Esther Maud, his second wife, before they got married, in which he expresses, with rare self-disclosure, his strong belief that monitions of the Inner Light should have precedence over purely rational considerations.* For instance, he wrote to her on May 12, 1784: "I have seen, when things were to human reason insurmountable, as my eye hath been regardful of Him from whom our help comes, mountains have been removed and way made when none could be expected to be found. I can only request of thee not to suffer the reasoning part too much to take place but principally regard the direction and leadings of truth, and I desire to do so too, and then we shall doubtless know all things to work together for our good . . . I have always found the greatest freedom and inclination toward thee when my mind was most nearly united to the fountain of all

*The Quakers believe that there is in every human being an inner source of light and guidance - "that of God in every man".

good". (It appears that Tuke felt it irreverent to name the name of God in ordinary discourse.)

The way the Quakers went ahead with the Retreat was astonishing. Some people supposed that the obvious first step was to rent a house in York. Not at all. They bought a property of eleven acres on a hill near York and engaged a London architect to design a house for £1883 4s. 1d. The house was planned to meet Tuke's ideas, which were original, imaginative and lavish. For instance, the house has long wide corridors; this was to enable restless patients, who could not be allowed out, to move about freely. The floors are of wood not stone; this was because mad people sometimes fight and a fall onto wood is less likely to cause serious injury than crashing onto stone. The windows are made of small panes, reinforced, so that no one could commit suicide out of them, but they do not look at all like prison windows. This is the architecture of compassion.

The equipment was imbued with the same idea. The patients were to have spoons (not knives) and not, like most lunatics, have to eat with their fingers. They were to have beds and not, like many lunatics, have to sleep on straw. (The reason for straw was that many patients were incontinent, but the Retreat was going to cope with incontinence.) Tuke's patients were to have their own cow, and 300 trees in their grounds, many of them planted by Tuke himself. These include the fine old beeches along the York Road wall.

Eventually it was announced that "The Retreat" would be ready to receive patients in June 1796. (This beautiful and expressive name was suggested by Mary Maria, Henry Tuke's wife.) The problem of staff had to be met. This was crucial and difficult. The basis of the management of the insane, not only in bad hospitals, but in hospitals which the Retreat consulted and respected, was fear; you must obtain an ascendancy over the patient's mind by severity of manner and if necessary by corporal punishment. This was accepted as the proper way to manage him (closely analogous to the accepted way of managing children, especially schoolboys); there was virtually no inspection of asylums, least of all by relatives; it is not surprising that there was much cruelty. There was another factor to be taken into account, which is that lunatics can be so irritating and so insolent that it is difficult not to be goaded into punishing them with severity. Sam Tuke, who at one time "almost lived" at the Retreat, said that in order to manage the insane with kindness you have to vanquish "some of the strongest impulses of our nature". Tuke had based his appeals for the Retreat on his notion that it would be better for Quakers who were mentally ill to be nursed by

Quakers, and this was specially true when they were convalescent and aware of what was going on and what was said. But in addition, Tuke had hoped that his institution would have a milder regime than others. He had to find mental nurses, who were efficient and who would be kind in spite of provocation, who were Quakers. He needed some at least who had some experience of mental nursing, but if they had, they would have had it probably in places where the rule of fear was implicitly accepted as the only and right way.

His plan was to get someone of his own class to superintend, with at least two experienced nurses, one man and one woman, working under him; and servants, of the type of "good upper servants" to do the work of the place and also help with patients. The first appointments were not very successful; the men and women they got were not very good. But the worst set-back of the early months was the death of the superintendent, Timothy Maud, a retired doctor. It proved impossible to find anybody else and William Tuke was obliged to offer "to attend daily for a week". He had to go on attending daily for nearly a year.

Tuke's attitude to people was described by Dr. Ferrus, who had been physician to Napoleon I; he visited the Retreat in 1826, when Tuke had been dead four years. "Mr. Tuke" he says "was a man in whose eyes neither riches nor poverty, imbecility nor genius, ought in the slightest degree to affect the bonds which unite all men in common. He thought with reason that justice and force ought to be evinced not by shouts and menaces, but by gentleness of character and calm of mind". Tuke knew nothing about insanity and very little about how the disease was controlled in the asylums of his time. But he had his own ideas.

The first was that the insane need as much physical comfort as possible. This was a very unfashionable notion. The insane were supposed to be insensitive, unaffected by cold, dirt, hunger, abuse and blows. Tuke's idea of the comfort they needed went beyond the assumption that lunatics should be clothed (as many lunatics were not); fed (many lunatics were starved to reduce their strength, but the meals at the Retreat were good and ample), clean, and treated with civility instead of vituperation. Most of us find, on holiday, at a new job or even staying with friends, that our sense of security is steadied when we find that the food is good. But Tuke's thoughts went beyond these basic provisions, to what de la Rive, a visitor to the Retreat in 1798, called "les douceurs de la vie"; tea, coffee, beer fruit, space, gardens, trees. Another visitor remarked that the Retreat looked like a large country farm with an enclosed garden. This

beauty and spaciousness went far beyond what most patients could have afforded for themselves and like enough the meals did too. One patient, asked by his visiting relatives what the place was called answered "Eden, Eden, Eden!"

It is rather moving that Tuke, in spite of carrying a great load of debt, had such generous ideas for his patients. As a younger man he had been strongly tempted to have a go at getting rich and living "rather high". One thinks of the beautiful establishment at Earham, where Elizabeth Fry (née Gurney) was brought up, a lovely house full of young people and their pleasures, horses, gardens, parties, music and dancing. Tuke felt that in the desire for wealth he recognised a temptation of the devil, and his wife thought so too. With great difficulty and regret he put these thoughts away and he never did become rich and have a well-to-do house and estate. But he was bent on providing generous comfort for his patients. There were four meals a day in the basic dietary, which was what the poor patients got; including meat five times a week, fruit at least twice, and a lot of milk from their own cows. They were always encouraged to eat freely, excessively if that seemed for a time to be what they needed. Women had tea or coffee, which were at that period luxuries, in the afternoon; and the men had beer. Patients who paid more had a more varied table.

It is a very interesting notion that comfort has therapeutic value. Comfort that is provided by other people does carry a spiritual overtone. Comfort is the primary language of love, the language in which a mother teaches her baby to have confidence in life. The significance of a cup of tea is very often not the tea but that fact that someone brought it to you, only because he or she wanted to help. Tuke's implied philosophy of comfort is the more remarkable in that the Quaker movement was against it, as contrary to "that simplicity that should be in us". Elizabeth Fry, before her marriage, visited the Retreat with her father, John Joseph Gurney; her comment is "We thought it extravagantly carried on".

The second principle which Tuke believed in as basic in the business of caring for the insane, was that patients should be kept "quiet and still". This was a natural enough thing for a Quaker to think; Quaker Meeting is a weekly exercise in obedience to the word of God "Be still and know". Within a very short time visitors to the Retreat were struck, even as they entered, with the sense of tranquillity. This was the more striking because experienced visitors to asylums expected a pandemonium of shrieks and noise. The sense of peace was confirmed as they moved about in the Retreat. But

this atmosphere was difficult to create. Patients and attendants coming from other hospitals would not be accustomed to being quiet.

In June 1796 they appointed a Dr. Fowler as visiting physician. The appointment gave offence in York; he had not had experience in the field of insanity, whereas there was in the city a doctor much respected for his treatment of mental patients. The reason why this man was passed over may have been that William Tuke, a strong-willed man, wanted to get his own way in the institution he was founding; he was more likely to do that working with a doctor who was not already an acknowledged specialist. There was, I think, another reason as well. Fowler was a man of strikingly independent mind. He had at one time worked in a chemist's shop in York, he qualified in medicine in Edinburgh and then had an appointment at the Infirmary at Stafford; while there he collaborated with the apothecary and developed an arsenical remedy for ague still known as Fowler's Solution; he then had a heart illness and had to stop work for a time, but came back to York to practice as a doctor in 1793. When he died he left notes on 6,000 cases; it was not usual at that time for doctors to keep such notes.

In September of 1796 they secured a very able Quaker girl called Katharine Allen to undertake charge of women patients. She had been trained in a Quaker asylum in Somerset, was full of confidence and kindness, and was for 27 years one of the greatest blessings of the Retreat.

William Tuke had never contemplated running his asylum himself. He found it an overwhelmingly heavy task. He got no help from friends, not even from members of the Retreat Committee which met there weekly. "All men desert me in matters essential" he wrote. "We are scarce of money." (Letter, January, 1797). A thing that worried him was that Joshua Cardingley, who was the experienced attendant in charge of male patients "cannot keep the men quiet and still". I can guess at one reason for this. The Sketch (published for the Retreat Committee in 1828) declares that at first the rule of fear prevailed at the Retreat and it implies that someone was using "the cudgel and the whip". It is impossible that Tuke did this; it is likely enough that Cardingley did. Now Connolly in his discussion (in his "Treatment of the Insane without Mechanical Restraint, 1856") of the effects of the use of force in an asylum, says that *any* resort to physical coercion engenders shouting and vituperation and gets all the patients into a chronic state of tension. If Cardingley was doing this I don't think Tuke knew; he does not

mention any such thing when he talks of the various difficulties and criticises Cardingley, though he noted that the men were more peaceful when Cardingley was absent. I imagine that during the hours of the day when William was himself at the Retreat he was in charge, and I do not think that he experienced difficulty in controlling patients; he was a man of tremendous presence and strength of character. But when he was not present, Cardingley was in charge and may have used his own methods. In January 1797 a patient contrived to commit suicide during the night, and this was attributed to Cardingley's negligence; he was instantly sacked. I am sure this was a good thing for the Retreat. He was succeeded by a not very colourful character called Sam Tottie, who seems to have been a good mental nurse.

The suicide perhaps brought to a head William's strong desire to find an adequate superintendent to take his place. He knew a man who he thought might do, and with some hesitation invited him to come to the Retreat on a temporary basis. This was George Jepson, a self-employed weaver-apothecary from Knaresborough, an unmarried man of 53; not a man of Tuke's own class, but literate. He was so modest that anyone might be forgiven for doubting whether he really had the ability to undertake all-round responsibility at the Retreat. He was very diffident about this himself, but after a trial period he was appointed superintendent on a permanent basis in the spring of 1797.

So now a lunatic asylum, built for 30 but at that time only accommodating 15, was being run by a tea merchant (Tuke continued to give this a lot of time), a weaver and a physician, none of whom had any experience of caring for the insane, with the help of a young girl with a few years' experience.

What did they make of it?

They quickly introduced two innovations.

The first was the decision of Fowler. On his appointment to the Retreat he set himself, by reading and visits to other asylums, to learn as much as he could about the new field which he had entered. He found the basic medical treatment for insanity was dehydration. Medical orthodoxy at that time was still dominated by the teaching of Galen (who had been physician to the Emperor Marcus Aurelius in the third century). This was the theory that the health of the body consists in the balance of the "humours" (liquids) and disease is an imbalance of them. It was believed that if you dehydrate by a variety of methods you must in the end drain away the "humour" that is causing the illness of insanity. These methods included

courses of purgatives, emetics, bleeding, cauterizing, seatons . . . (a seaton is a thread which has been passed through a fold of the flesh by a needle and left there; it will drip lymph). In addition to these treatments, administered as a definite programme over the summer months, shocks were used; these included falling suddenly through a trap door into deep cold water, "the bath of surprise"; and being strapped into a revolving chair and whirled round till there was loss of consciousness. This movement would create a disturbance in the semi-circular canals in the ear, and involve the loss of all sense of support and direction; it seems to be the most acutely terrifying experience known to man.

Fowler never used shocks. He did try out dehydrations. This orthodox teaching was by now under question, and medical men were beginning to lose confidence in them. Fowler approached the matter not at all like a doctor of his own time but like a scientist. He made notes of the patients' condition before and after these treatments. A very strong argument against them was the difficulty of administering them—patients disliked and resisted these horrible ministrations; while Tuke was doing his best to create a feeling of calm and confidence the attendants were being obliged to cajole or force patients to submit to disgusting performances and dosings. Dr. Fowler quickly put a stop to this; he said that if a patient strongly objected to treatment he was not to be forced. Not long after this he came to the conclusion that his observations did not *prove* that the dehydrating methods were the *cause* of any improvement. Of course one suspects that the relief of the patient when one of these treatments was suspended might make him a bit better for the time being, and the improvement could easily be attributed to the treatment and not to the cessation of it. But Fowler thought there was no case for continuing with this regimen and sadly announced that, so far as he knew, medicine had no remedy "for this most grievous of human diseases". This must instantly have relieved the whole atmosphere of the Retreat and made it possible for patients and staff to relax. It was not the end of Fowler's usefulness; he continued to visit two or three times a week. Patients were often physically ill, and moreover he had great influence with them. He was greatly valued.

A second immensely important innovation came from the initiative of George Jepson. He had, before coming to the Retreat, had his doubts about the wisdom of the regimen based on fear. Soon after his arrival and assumption of responsibility, he had an experience which settled his mind on this point. A patient became

dangerously excited; George knew that according to the orthodox opinion he ought to overpower him and get him secluded in a room by himself. George was a man of powerful physique, and he had no difficulty in over-mastering his patient. But when he had thus forced him into a room where he could be locked in, and went off to his own bed, he could not sleep. As he lay awake he decided that if in the morning he thought the patient had not been benefited by the enforced seclusion, he would never go against his own nature in that way again; he would manage some other way. When he went to see the man he found him not quiescent as a result of the night's rest, but resentful; he had done him harm and not good. Shortly after that Jepson told the management committee that he was not going to inspire fear but confidence and that he would not use force any more. The committee agreed. Dr. Fowler supported him; he said he could not medicate patients; George should be given his head to try out his own judgment and resources. George had great powers of persuasion, and could generally manage patients by this means.

Jepson had for some years had the idea that if wild animals can be tamed by gentle methods, probably men without reason can be managed that way. He began by practising gentleness in the ordinary practical affairs of every day. Patients have to wash and dress, to have meals, to get through the day without fights with each other, without assaults on attendants, without shouting matches or uncouth or improper behaviour. A very little experience of gentleness in management led him to modify his theory. He no longer conceived of his patients as wild animals, but as rational men, in whom rationality has been not destroyed but impaired. He asked himself what makes a sane person conform to the manners of his circle and decided it was very largely the desire to be respected. Obviously this motivation has been weakened in the insane; they become unaware of other people or wish to annoy them. The motivation to peaceableness needs strengthening. In most asylums of the time the motive was strengthened by fear, the fear of severity, of abusive language or of physical punishment. But George was convinced that a lot of the trouble that comes to asylum attendants, through their patients becoming dangerously violent, has been provoked by the attendants themselves through their own insolence and cruelty. Sometimes this rule of fear does produce the docility that is desired; patients became desperately obsequious, and this was horrible to see. The problem for the Retreat was therefore to find ways of strengthening the damaged motivation to reasonable behaviour, without cruelty and threats.

The heart of Jepson's method for controlling mad people without physical restraint or coercion was to give them such respect and personal attention that they would want to co-operate and not lose this respect that they needed so badly. The mad person loses the respect of other people and often knows he has lost it, and this is a grievous form of isolation. George observed them all the time, could see how they were getting on and what they were feeling and what would help them most. It was his habit to converse with them a lot, to take them for long walks to listen to them.

Insight was followed up by resource. He was infinitely inventive. He provided occupation, gardening and basket making for men, knitting and sewing for women, and he perceived that this helped them to improve. He realised that part of the misery of the manic patient is that he cannot sleep, and reflected that animals generally sleep after a heavy meal; so it became part of the custom of the Retreat that patients who were approaching furious mania were offered a meal and generally accepted it and generally slept. He spent long hours of companionable silence with a patient who raved at him; at last the man would stop and George would begin; the patient was attracted by the quiet kind voice and would listen and his condition would amend; these seances had to be repeated every few weeks, but after some months the patient went home recovered. If it would do a patient good and help to restore his "self-complacency" to be consulted about a sick cow, George would know it and take him out to see the cow. If a patient was nearly well and was bursting to write a poem, George would know it and supply him with writing materials. Similarly if a patient was getting worse, George would know it and get him into a quiet room before his excitement reached a difficult climax. If patients were going to fight, they would be diverted before blows were struck. George taught all his assistants to be incessantly on the watch.

If a patient had to be got into the set of leather straps, that would hamper but not destroy freedom of movement, George would do it by persuasion. If the patient seeing the straps promised to behave better, George would trust his word of honour and rarely be let down. Women patients did not need much persuasion; they had a green leather belt and long straps to the wrists that would permit them to feed themselves or blow their noses but not allow them to fight very well. They thought these very smart.

A study of the detail of George's handling of patients suggests that what was really going on was the therapy of love. Whatever the mildness or severity between two people, if they love one another

and mutually trust this love, it will do its work. This is compatible with the severe exercise of authority. As Ian Suttie said "What cures the psychiatric patient is the love of the psychiatrist". But this is a very ambiguous utterance. The word *love* has at least three quite distinct meanings as it is used in our language.

- (i) Sexual desire which may or may not be combined with tenderness.
- (ii) The deep and costly tenderness which binds two people in marriage or friendship. This involves such identification that if one suffers the other suffers also; that the one would make very heavy sacrifices for the other, whether the other knows about them or not. The instance Aristotle gave of this was the mother who puts her baby out to a wet nurse, because she believes this other woman can nourish the child better than she can, though she knows the child will then love the other woman and not her.

There seems to be a continuous scale from friendliness to this deep unselfish identification with the other.

- (iii) There is the compassion or concern which enables one person, say a relative or a trained social worker to give help to another.

But love is not enough. One of the saddest things is that people who love sometimes cannot help, partly because they do not understand, and partly because they have not the wit or the skill to find the ways of helping that are needed. This skill comes very largely through observation. People's capacity to perceive what other people are experiencing is inhibited sometimes by their assumption that other people feel as they do. For instance, someone is overcome by an expression of sympathy in bereavement from a neighbour; so she is careful never to express the sympathy she feels, and it may be that it is then assumed that she feels no sympathy and hurt is done. It is sometimes assumed that if people want help they will ask for it and it is interference to offer it; on the other hand some people are tongue-tied by grief or trouble and can only be helped by someone who will intrude. There is a capacity to perceive what other people are experiencing whether they are like you or not; and this is trainable.

Such understanding relieves spiritual isolation. The relief can come instantaneously through a word said in the middle of a busy day; but when people are suffering badly, more than this must be done. Some forms of mental illness in which this is a factor are so severe that the demand for attention and affection becomes

insatiable. Then if there is to be a cure, it will be, as the psychologists say, at the cost of "a life for a life". The daughter, sister, spouse, befriender, who is attempting to help at whatever cost is completely exhausted and overspent. Such sacrifice is sometimes made. Whether the patient is in the end cured and becomes normal I do not know; the psychiatrists seem to think it can happen. But this kind of redeeming love is of the second kind, not the third. The doctor, nurse, social worker cannot give such concentrated and costly love to one patient, because of the claim of other patients on energy and time and judgment. The characteristic of the third love is that it does not exhaust in this way and it leaves the judgment unimpaired. It seems in fact to be established that the third love in quite small doses is often enough to enable the one in need to recover; a weekly visit to a psychiatrist, sustained occasional contact with a loving relative, regular personal attention given in a school though only for short times, can suffice to put a damaged personality on its feet again, inspire hope, nerve the will to difficult exertions, set a cure going. The pleasure of being understood can be exquisite, and it can be accepted and trusted even through short occasional contacts. It was this kind of love that George and I think his colleagues were giving at the Retreat.

It is a modern discovery that this kind of loving can be to some extent taught and this is one reason why training for social service is needed, and in the main successful. The concern for the other person, which motivates the wish to understand, and also what Wordsworth calls "that best portion of a good man's life, his little nameless unremembered acts of kindness and of love", is infectious. Bus conductors and people in shops can give it, and this is one reason why shopping has social significance and why old and disabled people who cannot shop are deprived in a special way.

Part of what such understanding does is to reassure a person that he is recognised as the personality he is. A great deal of the most tiresome behaviour of the sane and of the insane is self-assertion. In the competitive jostle of the modern world, or of the modern family, it often happens that a person feels he is being crowded out, that he has become inconspicuous and is not attended to. Everyone to count for one and nobody for more than one, said Bentham; but it is very easy in a life lived in a crowd to feel that one does not count for as much as one. The sane cope with this; they adopt a policy of counter self-assertion, which is sometimes successful; or they adopt the role of mousey inconspicuousness (quite a lot of dress materials seem designed to help a woman to fade into the

landscape): or they go away and try again elsewhere, as most children do. But the damaged personality can neither bear it nor mend it. The insane become insanely touchy. A great deal of therapeutic treatment has the effect of re-assuring that patient that he is recognised for the person that he is, he does count for one, he has not had his individuality reduced to zero. This is the significance of the extra cup of tea (which was found necessary for some patients at the Retreat), the kind word, the flattery, the generous personal attention accorded in all sorts of ways.

George Jepson became convinced that when patients were given this kind of help, they were enabled to exert themselves to greater efforts and by difficult self-control to *cure* themselves, or at least to contribute to their cure. He made it his business to invent devices to excite and exploit their *amour propre*, and thus win their co-operation. His wife (he had married Katharin Allen) helped in this. She used to give occasional tea-parties; everybody wore their best clothes, there were delicious refreshments, apparently they went on all evening. These parties were an arduous exercise in self-control for some patients, and they were greatly enjoyed by all. It was rare that any regrettable incident occurred. The prize that was set before the patients of continuing in genial contact with the Superintendent, winning approval and becoming secure in the respect of those about them, was enough to nerve them for the hard struggle against "their propensities", and it was this self-command that brought the reward of recovery. So Jepson came to believe.



My Miracle

W. Grey Walter

Under the hot Italian Riviera sun in the summer of 1947 the conflict between swimming and watching a motor-bike race in Ospedaletti was a very serious one for Vivian and me. In the event, the motor bike race won. After all, it meant giving up only one of those deliciously lazy days' swimming and snorkling.

The climax of the drama was the astonishing performance of a little scooter – the Vespa – which averaged over 60 m.p.h. over a very exacting mountain course. This performance was sustained for well over an hour. After some 20 minutes of brilliant riding the scooter sustained its only minor fault – the silencer fell off. The loss of the silencer endowed this little machine with a splendidly raucous voice which we could hear around the entire course.

This mechanical incident in the little scooter was in great contrast to other failures which occurred in the more impressive motor bikes in the race; some of them resulted in retirement, and even serious injury. Perhaps I should have taken this as a warning, but a few months later I bought a Vespa (assembled in Bristol, where I live) to reduce my transport costs. Together with the encouragement in Ospedaletti my purchase cost me my life 20 years later. This story could be entitled “I died – but am still alive”. This may sound like an indirect claim to divinity but it reflects a serious difficulty: how can I bridge the gap between straightforward personal reminiscence and what I have heard from other people? The trouble is that I was unconscious from June 13 for about 3 weeks and have no memory at all for about 1 week before that – what is called “antrograde amnesia”. So for a month in my life I have no memory and during that period, for a few minutes, my breathing and pulse stopped, they tell me. Only by rapid application of the modern techniques did they haul me out of the grave. As a positive and comforting lesson I learned that dying need not be painful. I did not suffer at that time but my loved ones tell me that they were *in extremis* for several weeks. This, too, is a basic fact to bear in mind; the main sufferers in a vital tragedy may be the survivors, not necessarily the casualties.

So, to put what happened in context, I had better outline the events that led up to my accident and the brain injury that was so ironically fascinating for me as a brain scientist when I re-

covered consciousness. Over 20 years ago I got my first motor-scooter, a 125 c.c. two stroke Vespa that had transformed Italian life and thrilled me as a motor bike fan. "Vespa" means "Wasp" in Italian and its voice sounds fierce and effective. The firm of Piaggio in Genova designed and produced the first models because they were not allowed to go on with aircraft manufacture after Italy was defeated in World War II. One of the differences between a scooter and a motor bike is that in the scooter there is no bar between the steering and saddle. The advantage of this is that the rider can slip out of the saddle very easily and I learned to do this in my first years by practice in our garden and on the right-hand bends of the roads (right-hand bends have the unfavourable camber and often a film of oil and grit from passing cars). I fell off my Vespa several times in the first years but never hurt myself badly. I did learn from this and didn't come off at all for about ten years before the final accident of which I remember nothing at all; if there had been a human culprit I would have blamed him but, by another irony, it was a horse that brought about my downfall, or so I am told by my friends and colleagues. I will return to the causal sequence later, as reported to me, but the next experience I can recall for myself was lying in bed in a private room in hospital and gazing at the pale-blue ceiling. To my surprise, there was no element of bewilderment when I opened my eyes there, only a sort of acceptance. I had no idea *why* I was there, no memory of the previous month of crisis and salvation and it was several minutes before I discovered that my left eye was blind, my hair had been shaved off, and the little finger on my right hand was hard to move and tingled all the time. I managed to feel my face and head with my left hand and found a sunken part by my left eye and in patches all over queer, false, prickly feelings. The top of my head was numb all over; when I tapped it, I could hear the sound but not feel it at all. At that time I had been working with brain surgeons for 35 years and soon realised that I had had a brain operation and must be in Frenchay Hospital. But why? I began to feel over my body and found I had scabs over wounds on both my elbows and both my knees. This seemed very odd indeed at the time and I sat up to try and look at my knees. This effort elicited another sign of illness – sitting up made me feel terribly giddy and I had to lie back on the bed. For several days I couldn't stand at all and had to use a bottle to empty my bladder several times a day. I noticed that I produced more than a litre every day and nearly as much in the night. After the overpowering giddiness,

this polyuria was the second functional oddity I noticed, and now, four months later, it's the same, with "polydipsia" – drinking more than usual – as well. Then, still on my first morning of consciousness, I noticed by touch an open scar on my throat which puzzled me. It was horizontal and a little damp, between the rings of cartilage on my trachea. I uttered a few words of wonder and found my voice was odd – sort of flat and monotonous. Just then a ward Sister came in to take my temperature and then proffered a cup of tea which I welcomed. To my astonishment I couldn't taste it at all except for the sweetness of the sugar and never since have I had any real taste for food and drink except the tongue tastes of salt, sour, bitter and sweet. During the previous winter I had resolved to eat less and give up smoking so my loss of taste, or rather smell, fitted in quite well with my reformation. It was an odd feeling later on, when I managed to get home, to see someone smoking and not be able to smell the smoke at all; it made me resigned to the deficiency and ultimately to feel rather superior. I did try a few cigarettes from time to time and confirmed that they did nothing for me at all – I couldn't tell that I was smoking even when I inhaled. There were notices "You have been asked *not* to smoke" in all the hospital wards and rooms and I felt quite virtuous not having to make an effort to comply. I was told I had lost nearly 15 pounds of body-weight since the accident and when ultimately I was able to see my body in a looking glass I saw I had regained a waist-line, but my thighs had shrunk to the bone. I started to do some rather furtive exercises in bed, which must have looked quite erotic when the nursing sisters peeked in through the observation slot. Actually, this was one of the feelings that had faded – sex was only a word and not a passion to me for some months after. It was a strange experience to lie in bed for weeks, feeling better and more active every day, yet realising that what had been the great emotional force had somehow faded away since my brain had been bruised. This was a disturbing feature but not my principal worry; I doubted whether I could ever do my scientific job again and whether I would ever be entitled to draw my generous salary in future. I should explain that when our Institute started to subscribe to a superannuation scheme my pay was too low and my scale of living too high for me to afford to contribute, so, in effect, I had no prospect of a pension from the Institute. This meant that, should I fail in my job, my income would cease and I would have to accept the rigours of extreme poverty. I was 60 years old at the time of the accident, so the senile crisis was not so far off, and I felt

that my colleagues – who are all friends too – could explain my decline by advanced age, which they could forgive and mitigate with sympathy. The snag – in my imagination at least – was that an ageing scientist does not recover from his ailment, whereas some brains do recover from a concussion, and I tried to plan a way to persuade them that I was a convalescent patient rather than a presenile dementia.

That first morning that I remember after the accident I had several visitors, more welcome to me than the nursing staff, but not more skilful or attentive. They included the surgeons who had operated on my head, my friends and my son Timothy, and a selection of the others at the Institute. All these were in effect my saviours and, little by little, I gathered how terribly they had suffered in the last weeks. I feel impelled to say here that I acknowledge with pride and humility the enormous debt that I owe them – no less than life itself and the happiness that is beginning to lighten the horizon. Perhaps I should add that my anxiety included a special worry about my son Timothy, who was about to start his third year at Cambridge University. At the start of his first year his mother and I had discovered that he had the ghastly disease of muscular dystrophy, so my worry was about clinical and financial facts, not fantasies.

Actually, I did indulge in fantasy in the first few days I can remember. I could not account for the traces of my injuries and invoked three quite ludicrous dream-like visions which I elaborated as I lay on my back, in the intervals between visits. All these waking dreams attributed my troubles to my surgeon friends – quite falsely of course – and when I mentioned them the alleged culprits laughed out loud. The first fantasy was to account for the physical fact that two of my lower front teeth had disappeared; I had had a dream weeks before when we were preparing for a holiday that a friend and pupil of mine, Victor Rothschild (now Lord Rothschild) and his sister Miriam were running a travel agency and had sent us two slides, both picturing the inside of a mouth seen from the front. In one Victor was grinning from the back through the molar teeth with an Italian mountain on his shoulder. In the other slide Miriam was flashing her brown eyes through a gap between the front teeth and was nodding her head provocatively. I had not been surprised or puzzled at the inclusion of movement in a slide but I was convinced that the surgeons had operated on my jaw and teeth to provide just the oral landscape that the Rothschilds wanted for their non-existent travel agency. The other fantasy was to account

for the scars on my knees and elbows. These were nearly healed and I supposed that the surgeons had taken off my limbs and attached them to an American pilot who wanted to be flown cheaply to Australia. With my limbs on he had got into a small box and been sent to the other side of the world with a bit of space between his body and the box. He had rattled around a bit and borne the bruises on my projecting joints. The lack of incision scars at my hips and shoulders aroused my astonished admiration and it was this negative trace that I mentioned to the surgeons and that was what evoked their amusement and my enlightenment. The third systematic fantasy was about the changes in my head, including the blindness of my left eye. It suddenly occurred to me that the surgeons must have turned my head right round, dressed the hair at the back of my head to form a beard but somehow missed the connection of my left eye with the optic nerve. This, too, is quite absurd and impossible, but I told the surgeons and again they dismissed it with ridicule. My silly, elaborate fictions persuaded them to tell me some of the facts about the accident and operation. The operation was nearly 2 weeks after the accident because, they said, I was unconscious and otherwise too ill for head surgery, and in any case they couldn't decide what they should do. The operation lasted about 5 hours and included a detailed recording of the electrical activities all over the brain – "electro-corticography". This showed some peculiarities in various parts but nothing really sinister and they were able to sew up a tear in the membrane that was allowing brain fluid to leak down into my brain-stem. They thought it was this leak that had "killed" me and caused the other crises from which they and the nursing staff had extricated me. This seemed to make sense, although it didn't explain precisely why I had lost the sight of my left eye and the two lower front teeth. However it did account for my dizziness and loss of balance-sense when I sat up.

From that phase on I decided to make a resolute effort to re-establish my personality with the originality and creativity which had been, I supposed, my main contribution to the Institute brain-research. This decision was quite easy to make, since the alternative was resignation to my disability and from my position at the Institute. This latter seemed to me a sort of tragic legacy to my son Tim : why should he be made to suffer more from *my* accident? So I was determined to accept the responsibility of promoting and accelerating my recovery; not just recovery to my state a few months before, but recovery in such a way as to encourage my development to a few months in the future. My talks with the

people at the Institute had included their news and it was evident that research had been advancing rapidly on several fronts during my illness. It wouldn't be much good my going *back* 6 months; I must use my 6 months-ago-state as a spring board to project me ahead, hand in hand with my colleagues. The decision was easy but the act was devious and difficult. I had not been particularly introspective and so the first problem was to analyse myself so that I could specify the restoration in detail. This is not easy, especially when one's brain has been hurt and the destiny of oneself and one's family depends on it. I have got used to it now, but I still make mistakes and come up against apparently insoluble paradoxes. But I now do realise some of the basic complexities of human personality and the amount we still have to discover about how the brain works and how damage to it can be diagnosed and treated. I thought to myself that what I had determined to do was a part of my professional concern and that concept doubled my satisfaction with the prospect.

My first challenge was the physical state of my body. I couldn't look forward to a return to my full contribution if I were going to be a thinking vegetable – I must learn to stand and walk and talk and write and calculate and write programs for our computers and design experiments and . . . and . . . *THINK*. How did I think? Thinking involved “association”, “integration”, imagination, conceptualisation, generalisation, abstraction – how does one think about thinking? How much of thinking is verbalisation?

While these doubts and questions were floating through my clumsy consciousness, various visitors came, bearing gifts of papers, books, sweets, flowers, drinks and, most important and indispensable to me, love. The gifts were welcome, of course, in my spartan side-room, but their effect was to act as reminders of the feeling that had brought the givers. In those days I used to gaze at any modest present and recapture more readily the feeling that had grown so big for my loved ones. Sometimes I felt a tear trickle down my cheek. I thought at first it was a sensation due to my brain injury, but it was wet and a little salty so that I could acknowledge my sentiment as deep and pure.

When Vivian and Tim came I was enormously relieved because they looked quite well and chatted happily. The first time, I was still bed-fast but after 10 days or so I had begun to stagger around and we went for a short walk outside; we were able to see Vivian's new car, an orange sports coupé, from a distance. This re-opened the possibility of travel, which I had not envisaged. From then on

my thinking roamed and I got stuck on two ideas – to get home and to visit Italy.

About two weeks after my return to consciousness my friends told me they had arranged to take me for a drive in the country that afternoon. So I put on a jersey and a pair of trousers and walked slowly out to the car. It was the new one we had got for Tim, with plenty of room and power. That drive was my first real thrill after the accident; comfort, movement, change, love, company, all the factors one longs for and seldom finds all together. Tim came with us and we chatted intimately about the countryside and the car and I spoke a little too about my wounds and welfare. I was quite glad to get back to the hospital because I was a little tired after my first expedition. The country around Bristol is a grand place to drive through and my mental vision was full of the landscapes. It was a glorious experience to renew my knowledge of our physical world in that way and I felt no nervousness or fear at being on the road again. My amnesia for the accident was a sign of Nature's mercy to the afflicted : you can't be scared of what you don't remember.

Our next adventure was to visit my home again – but it was a little more complicated. For one thing my home is something special, a fine, detached house that I had had built in 1939, with a nice grassy garden, roses, two cars, five bedrooms, colour TV, central heating, and for me it was the image and symbol of normal practical creativity and convenience. I had also cultivated in hospital a dream of washing my hair with my favourite shampoo in our bathroom upstairs in our home. I had been given a bath every other day in hospital and washed my short but growing hair with the medicinal soap, but my head seemed to itch or tickle at night and I had conceived the notion that a special shampoo would be a relief. I think the irritation was where my skin was healing after the operation, but I became obsessed with the need to scrub it. The drive home was another thrill – 15 minutes of suburban avenues leading to our flat-roofed tawny-brick mansion and the armchairs on the patio overlooking the lawn. The sun shone brilliantly and we sat chatting and laughing. I was talking less than the others, thinking of my hair-washing project and rather abruptly I said I was going upstairs to do it. There was instant consternation and protest; we had been warned that I might have trouble going upstairs and could come down backwards, not having had to deal with a step since the crash. My companions had decided not to allow or approve my adventure and were horrified that I had planned it. All three objected fluently but I rose and went jerkily through to the staircase

and started to climb it. This was a little tricky and I had to hold on with my hands, but I got up all right with the others muttering and gasping close behind me. In the bathroom I managed to undress quite quickly, turned on the taps and got into the bath by holding my body up on my hands and lifting one leg after another into the tub. I could only just raise my feet high enough, and sank into the bath with relief. Sure enough, the special shampoo was there and I had the reward of a splendid two-stage hair wash. I couldn't smell the piney odour of the liquid but it looked and felt just right. When I had finished I extricated myself with the others' help and they insisted that I retire to our bed to rest from my exertions. They told me I lay there grinning like a Cheshire cat for half an hour, delighted with my achievement. To be in my own house, wash my own hair, view my own garden with my dear ones, was a unique experience, so reassuring of homeliness, security, stability, and, most important, love, that I felt from then on that I could and would recover my mentality and personality that those others had loved, and that I could return to work before too long with confidence and ample means to contribute and share with my professional friends. Perhaps my determination to shampoo was a bit too much on that first home visit but it turned out well and was an example of what I had decided I should do – to plan every day an exercise that was something new to do, but possible. The first one had been just walking a few steps, then standing on one leg and now I can do this with my eyes shut, but I had to practise every movement and re-learn actions that had been automatic for over half a century. It was a sobering shock to have to start from square one again, but also it was a revelation to have to analyse and resynthesise such simple acts. One can regain in this way the original novelty and excitement that energize living for children – to an adult the needs may be familiar enough, but the means to satisfy them have to be learned again and this can be fun. When I got up we drove quietly back to the hospital and it was quite a relief to return to the skilful care of the nursing staff; they had been so gentle, tactful and resourceful that I had the feeling that all my wants were anticipated and satisfied. This was a new and thrilling experience also; one that I hope all patients can share, even those that are as ill as I was. It may have something in common with the relief and courage that some people say they get from religious faith – a belief that there is divinity even in the most painful circumstances.

While I was in hospital my close colleague, Dr. Cheyne McCallum, had twice studied my electric brain activity, using the elaborate

recording and computing instruments we had installed in our new laboratory at Frenchay. This was next door to the ward I was in and I managed to walk there to lie on the couch. Our new methods include the analysis of brain changes during learning and we discovered a new sort of electric wave that develops always and only when a person learns a new task. The long name for this is the Contingent Negative Variation (or CNV), but it is also known as the Expectancy Wave because its appearance means that the person is expecting one event to follow another. The CNV is also related to motivation, conation, association, decision, discrimination and in fact most of the concepts that are involved in learning. We have found that in people with injured brains the CNV may be absent in parts of the brain that look normal otherwise. This means that high-level activity such as learning may not be possible for parts of the brain that are still alive and this subtle disability may account for the very long time – 10 years or so – over which brain injuries may seem to recover. We think a detailed study of the distribution of the CNV over the head can be a great help in finding out how much a damaged brain can do and also in advising friends and relatives how they can help the patient to recover his character. This task is very difficult because the CNV is very small – only about 20 millionths of a volt – and to determine its distribution over the head a computer has to be carefully programmed to display an electric map automatically time after time. We have two computers now, thanks to the insight and generosity of the Stone Foundation of Chicago, and both are used full-time to study and chart the CNV, so Cheyne had no difficulty in getting a clear set of charts and he and I were surprised and relieved to find there was nothing radically wrong with my CNV. At that time I was getting pretty active mentally, reflecting for long periods on how I could best regain my capacity and overcome my residual disabilities. I was still worried that I might find it hard to establish the originality and imagination that had been an important part of my contribution to brain research at the Institute. I had studied hundreds of cases of brain injury during the previous thirty years and followed their recovery. Many who had been as seriously hurt as I had been did recover physical health, but very few had regained posts of leadership and responsibility. It seemed likely that top jobs need just about all the brain, at any rate from time to time, and if a patient had to re-learn simple childish acts like walking, this may need brain parts that had previously been free for higher-level thinking. This proposition may lead to exciting new research, and our ignorance

of how the brain really works at top level was what I stumbled over at every turn of thought. During my first brain recording Cheyne noticed something that looked like an alpha rhythm in my brain records and was astonished because on the numerous occasions of my previous recordings I had never produced a single alpha wave. Long before we had been struck by the fact that about 15 out of 100 people have no alpha rhythm and we had found that these people were limited to visual imagery in their thinking. I am a marked visualist myself, and the appearance of an alpha rhythm after my brain injury suggested that it may have altered my personality. When we first discussed this I recalled that around the period of my alpha rhythm my mind seemed capable of "free-wheeling" – feeling blank but healthy, which was a novel experience for me. Later, my visual images began to return obtrusively and now I feel quite like I remember feeling before the injury. This is another effect that might be worth investigation : a significant brain abnormality may turn out to be the appearance of a new feature which would be quite normal for another person. The fine structure of personality still eludes us, and it may well be that we shall have to include elaborate studies of the chemistry of brain cells as well as their electric patterns in order to recognise the basis of a person's character.

Cheyne repeated the examination some days later and confirmed the health and normality of my brain waves. I enjoyed being a subject for the elaborate studies since I had to press a button as quickly as I could to stop a series of light-flashes, and there was always a click as a warning before the lights appeared. The situation is intended to test the ability and speed of the brain in learning the association between the signals and making the hand muscles respond as fast and economically as possible. It was a great comfort to have the objective confirmation of my recovery, particularly since I had discovered this effect myself five years before in a survey of autistic and normal children. One of the most dramatic services of scientists to medicine has been in the management of sick children who cannot co-operate because of their disability. The dilemma in the case of autistic children is that their failure to respond or interact with others may be due to an incompetence of their brains, *or*, the other way round, the lack of signs of high level brain activity may be due to their lack of interest in others. The causal relations between signs and symptoms is often hard to establish, particularly when the brain is involved. The many parts of the brain are interconnected in loops, and in such a complex of feed-back systems any

interference may have a dramatic effect without reaching a significant causal agent. That is one of the reasons why social psychology and brain physiology are so hard to fit together; there is no doubt that behaviour patterns emanate from the brain, but no two brains are alike and the differences between them are seen in the rapture and catastrophe of social dynamics. As a brain scientist, I found myself gradually more and more enmeshed in such problems, which had been the target of our Institute since its foundation in 1939. That I was fascinated by them suggested that I was regaining my original mentality but my remaining difficulty in finding an easy way to solutions alarmed me – I couldn't at that time see my way to cultivate creativity. So I decided to make myself accessible to my professional friends so that they could confide in me and share their dreams as well as their problems. That is what I enjoy most and I don't think of it as "work", although it needs training and practice like an elaborate game or sport. My attitude is by no means casual or frivolous, however. My "work" is a large part of my whole life and has been for over 40 years since I graduated at Cambridge. My experience of what is now called "electronics" is even longer – over 50 years since my father and I started to make "wireless" sets in 1919, before there was any broadcasting in Britain. This familiarity with electricity was a very lucky accident since the study of brain dynamics started as a combination of electro-technology and physiology. I was able to design and build my first amplifiers and oscillographs and with them I was able to locate the brain tumour in the first patient referred to me in 1935. So it was not only novel but ironical to become a patient myself after a lifetime studying others, and the outcome was all the more reassuring because I had been the one to develop and apply the methods that were being used. Of course, there are many other people involved in the same sort of study and the most satisfying feature of the special brain research societies is the warmth of friendship between the members. This does not impinge on the privacy of separate people but unites them in excitement and mutual esteem.

These were the thoughts that permeated my mind in the days I can remember in hospital and from them emerged my determination to return to brain research with the enrichment of my nearly fatal experience. The daily events in the hospital were the frequent little meals brought by the nurses, my tottering steps to the bathroom and lavatory and the exciting visits of my dear colleagues and relatives. As well as the nearby sympathisers, I was shown a sheaf of letters and cables from friends all over the world who expressed

in simple words what I had hoped and assumed, that they were almost lost in misery, but clinging to a shred of hope. The devoted visits and the affectionate messages were my path back to health and vigour. I learned that what I can remember is only a part of the service done me. I have a feeling that the strange state I was in for so long – apparently responding but not “conscious” – did not efface, but rather transferred my appreciation of what was done, so that when I did regain full consciousness, my recovery was directed to a high but attainable level, guided by the impalpable traces of early experience.

The definition of consciousness is vague and confusing; so many patients display long phases of responsiveness and may carry on quite long, and apparently reasonable and coherent, conversations soon after an operation, yet have no memory of that experience the day after. The anomaly is only noticed when the two days are compared. Both separately would be judged normal but together they reveal a gross but inexplicable abnormality. The brain mechanisms underlying memory are still obscure and we are not certain whether the notion of different grades or levels is realistic and helpful. For patients in such conditions it would be kind to assume the presence of some sort of awareness unless they are in a deep coma without a sign of response in brain or body. When an electric sign of brain response can be detected, there is objective evidence for hope of recovery provided that some sort of stimulating conditions can be maintained. This is a challenge to everyone connected with the patient, particularly those who know him well. In the absence of specific knowledge we have to depend on trial and reversible error, assuming that the criteria of health and recovery are clear and well known.

Now that I can look back and appreciate the grim situation I was in for so long, the suffering and effort of my dear and close friends seems the crucial factor that triggered my resolve to recover. I wanted to be worthy of their devotion, not merely to be able to regain my position at the Institute. The gruesome experience of my professional colleagues depressed and discouraged them in the first days after the accident. As it turned out, their hope was justified, but in those first days, of which I have no trace of memory, their fortitude must have needed cool imagination as well as warm affection.

Whatever the source of my friends' engagement with my condition, it reinforced my determination to regain my energy and concentration, of which the first sign was this writing, a prelude to the re-establishment of my full function in the Institute.

Prototypic Organisms VII

Mouse Embryology

Richard Gardner

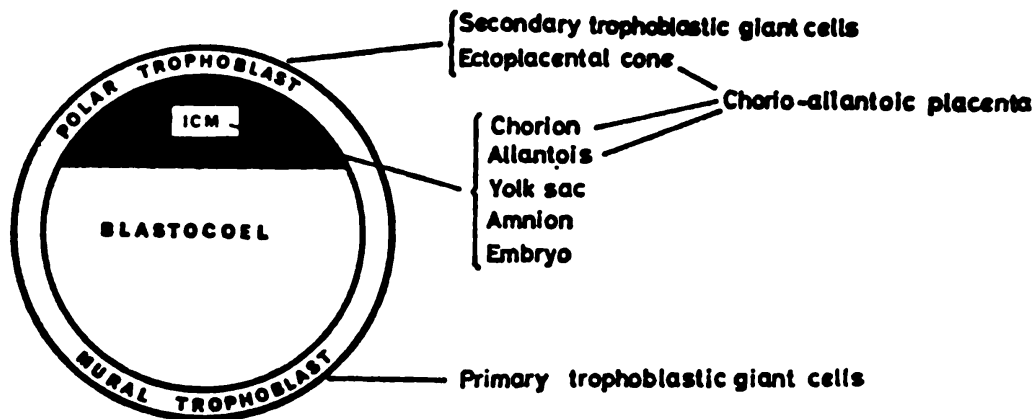
One of the greatest and most challenging mysteries of life is the problem of how the fertilised egg develops into a mature organism. It has long aroused man's curiosity though, paradoxically, he remains more ignorant of the development of his own and related species than many more remote forms. Thus the successive stages through which the mammalian embryo passes are very familiar, but experimental analyses of underlying processes were virtually non-existent until recently. The fact that development is normally completed within the mother and involves one or few embryos at a time is somewhat daunting for the embryologist.

Recently, however, several technical advances have given great impetus to the study of mammalian development. These include the use of purified hormones to increase up to sevenfold the number of eggs ovulated at a time, discovery of media that permit growth of early stages outside the mother, and perfection of procedures enabling their return to the uterus to complete development. The stages between fertilisation and attachment (implantation) in the uterus have hence been made available for experimental investigation. The mouse was the mammal of choice in this as many other areas of study because of its tremendous reproductive capacity and short generation interval (less than 10 weeks). In addition, more is known about the genetics of the mouse than any other Vertebrate except man. The mouse was indeed the first animal to which Mendelian principles of heredity were applied. Genetical detail is relevant both because the ultimate aim of the embryologist is to explain development in terms of the orderly temporal and spatial activity of genes, and also because, as we shall see later, marker genes provide us with a powerful analytical tool.

The fertilised mouse egg is under 1/10 mm in diameter when it begins dividing to yield 2, 4 and then 8 daughter cells as it descends the oviduct to reach the uterus. Embryos with intermediate cells numbers are often encountered because division of the daughter cells soon becomes asynchronous. They enter the uterus on the third day after fertilisation by which time they are solid balls of roughly 16 cells each, shaped like blackberries. Shortly after, fluid gathers to form a central cavity which then enlarges to reveal that the em-

bryos, now called blastocysts, are composed of two distinct groups of cells (see diagram). The fully formed blastocyst is thus a hollow sphere consisting of 60 or so cells, of which three quarters form the enveloping trophoblast layer and the remainder are completely enclosed as a discrete disc appropriately called the inner cell mass. There has been no net growth of the embryo up to this stage, only a parcelling of the egg substance into progressively smaller cells that look identical. Formation of the trophoblast and inner cell mass marks the first differentiation or specialisation of cells that is evident in mammalian development.

Delicate microsurgical techniques enable isolation of trophoblast from the inner cell mass of blastocysts and hence provide the opportunity to determine just how different these tissues are. When pieces of trophoblast are cultured they reform into spherical fluid-filled vesicles looking like blastocysts without inner cell masses, but do not join or aggregate with other similar pieces of tissue. Furthermore, if placed in the uterus they can implant as do normal blastocysts, though they fail to develop an embryo subsequently. Isolated inner cell masses behave entirely differently. They do not form vesicles in culture but readily aggregate to form spherical masses of cells, which are unable to implant in the uterus. We thus see that the properties of the two regions of the blastocyst are as distinct as their appearance suggests.



Diagrammatic section through the centre of the mouse blastocyst to show the inner cell mass (Black) and outer trophoblast (White). The presumed fate of these tissues in later development is as indicated on the right.

How does this difference come about? The short answer is that we do not know. Newly fertilised mouse eggs cultured at body temperature in a mixture of simple salts and protein develop into blastocysts which can continue development following return to the uterus. The maternal environment is evidently not required for formation of the two tissues of the blastocyst. Likewise, we can exclude the fertilising sperm from such a role, since unfertilised eggs may be persuaded under certain conditions to form respectable blastocysts.

A further possibility, suggested some years ago, was that the inner cell mass and trophoblast were predetermined in the egg before it even began to divide. This idea stemmed from the finding that two regions could be discerned in stained eggs, and that a similar difference in staining was found between inner cell mass and trophoblast. This could be fortuitous. Unfortunately, this "segregation" hypothesis is very difficult to test experimentally because the regions in question cannot be resolved in living eggs and embryos. The following experimental results make it very unlikely.

The first approach is either to destroy or isolate cells from dividing eggs and see how development proceeds. It is found that single cells from 2- or 4-cell embryos develop into normal blastocysts and offspring. Even a proportion of 8-cell embryos where all but one cell had been destroyed were able to develop into live young in the case of the rabbit.

Conversely, cells can be added to the developing embryo. This is achieved most simply by removing the protective membrane from 8-cell stages whose surfaces are particularly sticky, and culturing them in contact in pairs. So long as the cells of one member of each pair are suitably tagged their subsequent deployment can be followed. Such embryo pairs almost invariably aggregate like the inner cell masses mentioned earlier, and continue dividing to form giant blastocysts of normal appearance. When these blastocysts are inspected closely the cells descended from the two original 8-cell stages appear to be distributed randomly between inner cell mass and trophoblast. In some cases both contribute to each of the tissues, in others both to one and one to the other, and vice versa. This result obviously conflicts with the "segregation" hypothesis which predicts that cells from both embryos should be partitioned equally between trophoblast and inner cell mass.

A further approach is to place a cell or cells from dividing eggs of one mouse strain outside or inside the cells of other embryos carrying suitable markers, and then to determine where their

progeny come to lie. Cells placed on the outside tend to contribute to the trophoblast and those placed on the inside to the inner cell mass. This, it must be emphasised, is only a tendency to which exceptions may be found. Nonetheless, it again conflicts with the idea of segregation or predetermination within the egg.

The above experiments have prompted the alternative idea that all cells of the egg are destined to become trophoblast, unless they are enclosed within the developing mass between the 8- to 16-cell stage. It is suggested that the enclosed cells, now being in a different environment, acquire the property to develop into inner cell mass cells. The validity of this hypothesis is far from established, but these experiments nevertheless show that the early stages of mammalian developments are extremely resilient and encourage us to look at these stages rather than maturation of the egg for decisive events in development.

What about the subsequent development of trophoblast and inner cell mass once they have formed? The parts of the conceptus to which they are supposed to give rise are indicated in the Diagram. These conclusions rest on detailed examination of embryos from successive stages of development that have been cut into very thin slices and stained. The procedure is similar to trying to reconstruct the plot of a cine film by studying, say, every 30th frame. The outline is acceptable but details are hazy. This problem was overcome with the considerably larger frog eggs by staining patches of cells with harmless dyes and thereby mapping the fate of each region. This is not practicable in mammals, but we can fortunately approach the question of cell lineage by different experiments.

As mentioned earlier trophoblast, devoid of inner cell mass, implants, but thereafter produces only a few very large cells called primary giant cells whose function is obscure. Isolated inner cell masses neither implant nor grow. If, however, the two tissues are recombined normal development ensues. This suggests that the inner cell mass plays a role in the development of all parts of the mouse conceptus except giant cells. Its presence is necessary even for the growth of the ectoplacental cone, which is supposed to be of trophoblastic origin. Basically, there are two ways the inner cell mass could exert its effect. The first is by actually providing the cells that give rise to a particular structure. Alternatively, it could interact with the trophoblast to cause the latter to develop the part in question.

We can begin to unravel these questions by opening up the trophoblast wall of the blastocyst and inserting cells into its fluid-

filled cavity. So long as the donor cells are recognisably different from those of the host blastocyst we can determine the parts of the developing conceptus to which they contribute. First, cells for injection were obtained from trophoblast or inner cell mass of blastocysts of a pigmented strain of mouse in which one pair of chromosomes were unusually small. The host blastocysts belonged to an albino strain whose chromosomes were normal. The results were quite clear. Many of the offspring that developed from blastocysts injected with inner cell mass cells showed a hotch-potch of pigmented and albino patches in their coats instead of just albino. Preparations of chromosomes from internal organs of these tetraparental mice revealed that they too were intimate mixtures of both donor and host cells. Hence the failure of isolated trophoblast to develop an embryo proper is because, in accordance with descriptive studies, the inner cell mass provides the cells from which the foetus takes origin. Indeed, just one injected donor cell can contribute nearly half the cells of the resulting mouse. This very dramatic result suggests that the embryo itself, as distinct from its membranes, probably arises from 3–5 of the 15 or so inner mass cells in the blastocyst. Trophoblast cells did not colonise the embryos following their injection into blastocysts.

The fact that a single cell can make a readily detectable contribution after injection into host blastocysts is useful as well as dramatic. It enables us, for example, to find out when particular events occur such as the setting aside of the 3–5 cells of the embryo itself. This is done by taking an inner mass cell from a blastocyst of a particular age, injecting it, and then looking for its progeny both in the host embryo and membranes soon after implantation. Donor type cells are found in both, so the originally injected cell was not specifically committed to form the embryo at the time of transfer. We can conclude from experiments of this type that cells are not so committed until after implantation.

Although this type of approach is still in its infancy it promises to enable us to build up a coherent picture of when parts of the conceptus arise, where they develop from, and possibly how many cells are involved. Knowledge of this sort is fundamental to further understanding of mammalian development.

Composite embryos produced by aggregating dividing eggs or injecting cells into blastocysts are at first larger than normal since they contain up to twice as many cells. Nevertheless, they develop into foetuses and offspring of normal size. This might be expected if the entire embryo develops from a small fixed number of cells,

though the fate of the excess cells remains unexplained. Individuals containing cells derived from more than one fertilised egg are called chimaeras, an unfortunate term in view of its mythological connotations. Chimaeric mice produced by the above procedures are no different from normal mice in appearance, health and longevity. Indeed chimaeras occur naturally in mammals including man, either by union of twin embryos very early in development or more often by exchange of blood and trophoblast cells between mother and foetus or between foetuses. Recipients of transplanted organs are also chimaeras, though here immunological reactions are problems not encountered in cellular exchanges between embryos.

Earlier studies of these natural chimaeras illuminated a number of important aspects of biology. However, their rarity limits their value. The immense value of experimentally produced mouse chimaeras is that they can be produced at will, and that the number and diversity of genetic differences between cells that are brought together in a single embryo is under the control of the investigator and is in principle unlimited. It is impossible here to do more than hint at the many ways these unique animals may be used to further our understanding of developmental processes.

When the two or more component cell populations differ in genes affecting pigmentation, the chimaerism can be seen as a two dimensional pattern on the surface of the living animal. The patterns produced for example by mixed pigmented and albino cells are very variable, but show several consistent features. Pepper-and-salt markings due to complete admixture of albino and pigmented hairs is never seen. Instead, more or less discrete transverse bands of one or other colour is the rule. Such bands are often asymmetric, ending at the dorsal midline.

How are these patterns explained? The pigment cell precursors have been shown to arise either side of the mid-dorsal region of the early embryo and thereafter to migrate transversely towards the belly dividing as they do so. The smallest patches are hence believed to be areas populated by the descendents of one precursor cell. Adjacent clones, as they are called, can be of the same or opposite type, thus leading to variation in band width. What we have done is to introduce 2 distinct cell populations into the precursor pool of the pigmentary system and thereby render visible the ordered unitary basis underlying its development. Since all cells of conventional mice carry the same genes for pigmentation, adjacent clones are therefore identical and their boundaries not revealed.

Though patterns are not so readily apparent in other organs of the body, study of chimaeras can provide estimates of the number of cells from which they take origin. The fact that all organs of chimaeras can contain cells of both contributing embryos sets a lower limit of 2 precursor cells. If the 2 cell types are available in equal numbers before a particular organ develops it will draw on them randomly for its precursor cells. The situation is analogous to tossing coins. With a precursor number of only 2, one half of the offspring will be expected to contain both types and the remaining half only one or the other. As the number of precursor cells increases the chances of getting an organ composed exclusively of cells of one type diminishes. By obtaining an estimate of the frequency of chimaeras of the latter type it is possible to estimate also the size of the precursor cell pool. This sort of analysis depends on various assumptions such as, for example, that the cells from the two embryos do have an equal chance of contributing and divide at similar rates. Figures are thus necessarily imprecise but do indicate that, as with the embryo itself, most organs of the body such as liver, kidneys and blood each arise by clonal division of a very few cells.

Mouse chimaeras have been used to clarify other aspects of development. For example, half of them will be expected to contain cells of both sexes because the sex ratio is unity during early development and embryos are paired at random. Such male-female chimaeras shed light on the process of sexual development. Intersexes or hermaphrodites are rare. Most sex chimaeras are indistinguishable from normal males and females and are often fertile. However, unlike chimaeras obtained from embryos of like sex, they only produce germ cells of the constituent embryo whose sex corresponds with that of the chimaera. For example, if a fertile male chimaera develops from an albino female embryo combined with a pigmented male one, all its spermatozoa will be of the pigmented type. If, on the other hand, it became female, all its eggs would be of the albino type. In other words a genetically male germ cell cannot develop as an egg or a female one as a sperm. Such reversal of germ cell development is common among lower Vertebrates.

The sphere of action of genes can also be clarified by use of experimental chimaeras. Many mutant genes exist that have adverse effects on different developmental processes. If the action of such a gene is restricted to the cell carrying it, combining mutant with normal cells in chimaeras is unlikely to correct their defect. Patches of normal and mutant cells will develop in tissues where the gene is

active. If, on the other hand, mutant cells fail to produce a diffusible substance or produce an inactive one, the defect can be ameliorated or corrected by the activity of normal cells.

Inbred strains of mice exist that differ in susceptibility to particular types of cancer. High susceptibility to breast cancer characterises one strain, in which the incidence of tumours nears 100% in later life. What happens when chimaeras are made between embryos of this and a low susceptibility strain? The answer is unequivocal. Tumours develop as usual, but only involve cells of the high susceptibility type. The malignant change is not transmitted to cells of the other type.

To what extent can we rely on results obtained from these artificially assembled mice? The existence of occasional natural chimaeras is one point in favour. Nature has, however, provided another means whereby we can corroborate many of the conclusions obtained from man-made chimaeric mice. Female mammals carry two X chromosomes in their cells (males one X and a Y chromosome), one of which is switched off or inactive. This is probably because the X chromosome, unlike the much smaller Y chromosome, carries many genes whose function is unrelated to sex. Females thus have an extra dose of all these genes compared with males. Balance is restored by one X being turned off in each cell of female embryos early in development. It is believed to be random which one is switched off, but once the decision has been made in a particular cell all its progeny have the same X inactive. Since all except the most inbred females will have some genes different on the two X chromosomes, two populations of cells are thereby generated within the embryo without alteration in its cell number or indeed any form of interference. Though the use of such females is limited to the study of genes on this one pair of chromosomes, they provide closely similar results to chimaeras regarding coat patterns and clonal development.

Recently, preimplantation mouse embryos have been deep frozen, stored briefly, and then thawed in such a way as to enable them to develop into normal mice. This breakthrough will permit convenient storage and transport of the many mutant strains useful in embryological studies. This consideration, as also those described earlier, suggests that further study of the mouse as a model of mammalian development will both benefit man and satisfy his curiosity.

Review Discussion: *Nan Fairbrother's "New Lives, New Landscapes"** *John Watson, David Robinson, Jenny Graves*

I

The entire population of the world (3,000 million), says the author of this book, could be housed in Britain (60 million acres); and we have it on the authority of Mr. Malcolm Muggeridge that they could all be accommodated in the Isle of Wight at the admittedly high density of one square foot each.

Nan Fairbrother was not a statistician, but a sociologist and a landscape architect. It was enough for her that despite the ever-increasing population of Britain there is still ample land available. Nor was she in any sense a sentimentalist. She dearly loved the land but deplored its unwise user; her book might have been subtitled "Wherefore this waste?"

Part I, "A new society in a new setting", tells the story of our countryside. She begins with primitive man who settled where the forests were thinnest and the soil easiest to reclaim and work. Then through the Celtic and Roman periods, and the Anglo-Saxon period which followed the Roman departure. We learn of the Anglo-Saxon system of agriculture; of the conversion of the woodlands into open country, with a loss of timber the gravity of which was recognized even in the Middle Ages; of the planting and replanting of trees, possibly due to Evelyn's influence, in the eighteenth and nineteenth centuries; of the Enclosures; finally, of the far-reaching consequences of the Industrial Revolution.

Part II is largely concerned with planning. She admits that the nineteenth century was a period of sweeping social changes but asserts, a little surprisingly, that planning was effectively established only by the Town and Country Planning Acts (sic) of 1947. Important as the Act of 1947 was, should there not be brief mention of its forerunners – the Town and Country Planning Act 1932, which at least *empowered* the local authorities to plan their areas, and the Restriction of Ribbon Development Act 1935? But she is justified in her comment that over the years, by and large, we have

* Architectural Press, 1970.

tended primarily to plan the towns, leaving the country, subject to restrictions, to plan itself.

The author has much to say about Forest Parks, Green Belts and Special Areas. The disciples of Ebenezer Howard will be gratified by her observation that “the brave new towns . . . with all their faults are a bold and creative achievement which all the world comes to see”. But although she welcomes the advent of the New Towns as one antidote to the haphazard growth of our existing conurbations – “rings of concentric development like the layers of an onion round the old centre” – she is not averse to high-density living: “Space can be better planned, circulation can be multi-level, houses (in time) be sound proofed, gardens can be room-sized on roofs, cars for leisure can be stored underground . . .” Yet later she stresses the value of privacy! Are privacy and such a conception compatible?

The “green urban landscape”, she complains, is miscalled the “urban fringe”. Too often the description implies an urban development downgraded. It has four possible uses – two good and two bad. One good use is farming which depends on condition; the other amenity which depends on cost. The two bad uses are determined by policy. One is industrial but undeveloped; the other dereliction by default. Unused space, she says, is dead space. Even motor-ways can help. She instances the M1 in South Yorkshire which has cleared the dereliction in its path and has created an incentive to develop the areas it goes through.

Then about farming. Few admire the landscape of modern agriculture but, like any other industry, there is no standing still. The alternatives – a perpetuation of our small fields and the preservation of our antiquated homesteads – spell agricultural slumdom. It is a fallacy to assume, as many do, that modern methods of food production and the beauty of our landscape must of necessity cancel each other out. Destruction of our hedgerows and the felling of our hedgerow timber may indeed be inevitable; but can we not replace the trees we fell by saplings sited strategically and in groups at odd corners? And why, she demands, (although she admits to a recent improvement) are modern agricultural buildings so ugly?

And then about roads. “Even a new minor road alters the potential of an area and a new motor-way can change a whole region’s development”. Our lanes, she laments, are disappearing fast. They were never designed for motor traffic and to widen or straighten a lane is simply to destroy it. She advocates more

“channelling” of cars into suitable routes and the provision of more stopping places whence motorists can enjoy the view.

The remainder of the book contains the author’s proposals for the translation of accepted land-use policy into appropriate landscape by the application of “simple general principles”. There are chapters on “landscape organization”, “landscape pattern”, “landscape material” and “landscape texture”. But regrettably there is no chapter on “landscape finance”, an aspect of her proposals which she barely mentions. Even when extolling the undoubted merits of the 1947 Act she makes no reference to its brave, if abortive, attempt to solve the problems of *compensation*, and its corollary *betterment*, which for decades have been the town and country planner’s nightmare. On the final page she claims that the cost of her proposals would not be high and in amenity value-for-money would be minimal. But what is “high”? And what is “minimal”?

The book abounds with quotations and there are touches of dry humour. There is an elaborate index. The copious illustrations are delightful.

John Watson

II

Nan Fairbrother set herself a daunting task – to make us look afresh at our surroundings. She sought acknowledgement that new life styles and evolving forms of economic activity demand, and will inevitably create, new landscapes. Her aim was to re-ignite our concern for the quality of the landscapes which are created and their fitness for human purposes. This remarkable book demonstrates the possibility of a “New Deal” for the British landscape.

Another author might have entitled it “New Technologies, New Landscapes”. Its relevance rests firmly on an understanding of the technical requirements of mechanised agriculture and land reclamation, motorways, commercial forestry, reservoirs etc. Nan Fairbrother’s acceptance of change is implicit in the title she chose for her book. But so too is her concern for the human requirements of landscape. For her, landscape planning had to come to terms with a realistic assessment of the needs of a new industrial economy; the aspirations and behaviour of an increasing population; and the constraints and potential of our natural resources. She believed that a favourable solution was possible and encourages us to attempt it.

The book has something to say to the planner and the planned; the industrialist and the industrialised; the farmer and the day-visitor to the countryside; the landscape architect and the suburban rose-grower; the public authority and the private person. It chides and cherishes each in turn. Although presented with a charming modesty, humanity and wit, the central argument is strongly developed and purposeful. Unless we develop a coherent landscape policy appropriate to the changing conditions of our time we disadvantage ourselves, we fail preceding generations in the heritage which they handed on to us, and we prejudice the environmental opportunities of generations yet to come.

Nan Fairbrother identifies planning and the making of land-use policies as the first stage in the conscious creation of new environments. She rightly comments that this stage of the process should not be divorced from those which succeed it. Too often planning ends with the suggestion of land-use patterns to meet the quantitative needs of society. Yet qualitative needs demand that these land-use policies should be translated into appropriate landscapes. Indeed the policies should be influenced in the first place by the possibility of suitable landscape development. Hence the value of the suggestion that Planning Authorities should devise general landscape strategies based on the character and ecological potential of Landscape Regions. These strategies would provide guidelines to ensure that particular land-uses operated in landscapes designed not only for their function but to fit sympathetically into the wider landscape setting.

The strength of this suggestion rests not so much on its theoretical neatness as on the underlying acceptance of the challenge of designing new landscapes for new technologies. Land-use and associated landscape policies which are seen to be based on an understanding of the practical needs of land-users stand a far better chance of implementation than theoretical constructs which oppose the momentum of change. In this view, the emphasis switches from our present concentration on the preservation of landscapes whose qualities rest on traditional patterns of countryside use to the search for a new landscape balance. More emphasis on the renewal of environments which are already derelict, where a more truly "creative job with a bulldozer" is possible than any of Miss Fairbrother's Welsh wall bashers might ever imagine: an acceptance of a low-land countryside scene which is more open and uncompromisingly functional in character: a recognition that design for urban access to the countryside also requires design for rural protection: close

attention to the detailed landscaping of urban areas: and a forecast of the need for new ecologically based techniques to manage near-wilderness settings for upland recreation – these are but some of the themes within the sweep of Miss Fairbrother's vision. Always the view is optimistic – the emphasis on the possibilities rather than the problems. The thesis is that if landscape designers and planners would take a sufficiently informed and dynamic view in setting out a clear framework, the people have the will and can harness the technology to fill in the detail.

Miss Fairbrother believes that people care about their landscape and can be led to understand its complexities and fragility more deeply. She recognises that unobtrusive design can aid enjoyment and minimise destruction. But if people are to be shut out they must also be allowed to look in – from scenic roads, from motorways which are at one with the landscape, from well-designed stopping places, over twentieth century ha-has, and through the glass walls of hospital boiler houses! In this book, “planning-is-for-people” is no shop-soiled slogan. The text is shot through with sympathy for the quirks of human aspiration and personality – the argument so tellingly pointed by quotations, perceptively captioned photographs, and reminiscences. We all influence the landscape. We are asked to do so with the purpose of increasing the quality of life.

In a book of such staggering scope it is inevitable that some points are not fully resolved, or not sufficiently developed to be as convincing as the bulk of the argument. The credo that “the first essential aim in landscape design” is “to be able to say with conviction: This is town. This is country” leads perhaps to a more simplistic view of the new landscape pattern than new life styles will tolerate or justify. Miss Fairbrother applauds the concept of a town as a “special sort of park in the countryside”, a tree-circled distinct environment. Where lowland is marginal for agriculture, however, urban growth may yet take the form of a special sort of countryside – less compact and self-contained perhaps, but one hopes even more leafy with trees than her own depiction of the sympathetic living environment. Again, in making the point that landscape policies should promote a distinct character for each Landscape Region, Miss Fairbrother is in danger of appearing a too rigid fundamentalist in her campaign for the use of local trees and shrubs.

There are omissions in good faith. The healthy nature of the new farming landscape is too readily assumed; or rather, good sense and responsibility in the use of sprays, fertilisers and intensive cultiva-

tions are too readily credited to the new farmers. And inevitably there are gaps in the mechanisms suggested, for implementing such a wide-ranging scenario. For example, the new upland recreational areas of “primitive” landscape are left, not merely in the wilderness, but in an organisational limbo.

But the book is intended as a primer – not a blue print. It says enough to stimulate even the least imaginative. It is a bold, bright vision – and I believe it will prove increasingly influential.

David Robinson

III

Nan Fairbrother wrote several books on the theme of man and his surroundings, and in all of them show her practical good sense and appreciation of the qualities of the environment. Her last book, which should and will become required reading for all landscape architects, starts with an ironic statement made as long ago as 1864 – “the destructive agency of man becomes more and more energetic as he advances in civilisation”. She proceeded to analyse the revolutions that have taken place earlier in our history, with some illuminating notes of things that are so often overlooked – the thought that the Mediterranean area, classical bare hillsides and olive groves and maquis, is a mature dustbowl created by pastoral man and his overstocking of flocks, and that our country also cannot be said anywhere to be in a state of Nature. We are now trying to preserve the results of the revolution before last, the Enclosure Acts, which chequered our lowlands with hedgerows and tiny fields, and the Clearances, which eroded the Highlands, already eroded once by the glaciers which formed them into the stark scenery which precluded their prosperous settlement by man. Landscape architects are now involved in all aspects of this work – conserving and renewing areas where the *status quo* is desirable but needs attention to keep it the way it is – I am thinking here of a situation in which arrested climax is the state to be maintained, and where an ecological training helps us to do this with the minimum of disruption to the scenery – and by fitting in new developments so that the alteration may not necessarily be minimal, but is for the better in as many ways as possible.

Miss Fairbrother identified these problems pressing down on the landscape of Britain, and the ideas she offered of how to fit them all in to a finite area without overwhelming it are practical. Her

deep understanding for the countryside and indeed the urban scene also, was set out in an unsentimental but lighthearted style that is a pleasure to read. "New Lives" is however perfectly serious in intent, and includes more commonsense than usual. She gave many examples of what has been done, and what can happen to make our contributions worthwhile. A surprising amount of improvement is made by what can be described as just a small change in the way of thinking, and she gave pictures to prove this – a suburban roadside with a lush growth of "weeds" which quite invites one to go and live there, and another length of the same road shorn to a suburban monotony; the before and after views of a village, delightful now it has been freed from the effects of wirescape. She had some interesting things to say about the people who so often are the moving spirits in this latter type of amenity work, and divides them into three classes, in the third of which, the Translators, landscape architects must be ranged. Landscape Value is so often equated with pre-industrial use, and changes in this are resisted by many of us, notably the preservation societies; these need to be re-oriented towards becoming conservation societies, and many of them at last are doing this. Landscape architects are thought of as the natural friends of these societies, but it is sometimes difficult to judge the value of unqualified acceptance of the thing that exists, or of the work which can be done to alter it. Practicality is now a most important part of our way of looking at things. As well as the knowledge of what can be done to translate a situation, for instance the plant species which will grow on a derelict dump, we need also the eye to see how to alter the contours and place the plants, and the ability to show the initiators of the scheme what it will look like and what it *can* look like, given the management we should also be planning, not to mention the provision of some realistic costing. This last is always difficult to estimate accurately, and there is the added drawback that people seem to think *planting* should not cost a lot; any small percentage that should be added to help integrate a road or a building into the existing landscape by giving it a new setting or repairing the raw edges of the off-site existing planting, is often regarded as quite unnecessarily high. It is sometimes omitted altogether and is certainly the first thing to be raided if there is overspending elsewhere on the project. Miss Fairbrother shows us wittily and conclusively how important this work is.

The impact on the countryside by masses of people intent on "recreation" is dealt with at some length, as it was obvious to her though not, unfortunately, to a great many people who are catering

for this new taste, that the country can be made available up to a certain point rather than getting blasted wide open. And not such a new taste either – Wordsworth’s poems encouraged many admirers to visit the Lake District by the newfangled train in his own day, to his utmost disgust. It is all too easy to overwhelm the thing one has come to see by sheer weight of numbers and if not kill it off entirely, force it to change in order to accommodate those numbers. The National Parks which were designated in 1949 had as their original policy the preservation of the natural beauty of the chosen areas and the ensuring of public access for everyone to enjoy them. In the intervening 23 years they have provided a case study of management for recreation under changing conditions for too many people who have too many, and often incompatible, types of recreation.

The changes in farming practice, are also assessed in the light of their impact on the countryside. To integrate good farming practice and the visitor from the city, a lot of practical thought has to go into the details that add up to an economically possible way of life for the farmer and the sort of life that the visitor has come to see. Miss Fairbrother herself, as someone who spent eight years on a farm, mostly in the rubber-bootless wartime, was under no illusions that the quality of life is intrinsically better in rural areas. The social and economic changes of the last 150 years have brought us far from the landscapes of Constable – “the marvel is not that the old agricultural landscape is going, but that it should have survived at all into the last third of the 20th Century for anyone now alive to admire” – but it is possible today to compose landscapes of much value by careful siting of buildings, planting the unproductive corners which would otherwise have become thickets of nettles harbouring litter, and general attention to detail, so that a picture is designed and provided which is easy to maintain later. When labour was cheap, the farmers and landowners could afford to have the field corners scythed and the ditches cleared by hand, giving the country an intimate, small-scale, cared-for-but-casual quality that, as she so rightly points out, cannot be kept up any longer on a scale larger than a cottage garden. It is also important that the urban and rural landscapes are not merged into a grey no-man’s-land, but remain distinct and clearly defined. She suggests that they need to be insulated from each other; the best way to do that is by planting tree belts since, if the land is the site, vegetation is the architecture, and when a site is built on, it is the architecture we notice. In the large scale rural scenery the only thing we can do

that will register at all is to alter the plant cover. This planting, on every bit of land available, however derelict, would give even the most neglected area a positive value.

Miss Fairbrother has many pertinent things to say : on the scale of a livable-in townscape which seems so difficult to achieve in these days of standards and yardsticks ; on the dereliction-by-default, when industrial land is left without a ground-use ; and in her delightfully pointed remarks about grass. She shows how its misuse produces a vast amount of expensively-kept bad landscape, and its easy growth permits and indeed encourages bad layout. If unthought-out areas grew poison ivy instead, our designs would improve very quickly. Where there is nothing in particular, we put grass, and not content with thus painting the area green, we then keep it so by constant mowing : “the Fitted-carpet Complex – every area large or small must be neatly covered with the same short green pile – green-carpeting as an end in itself irrespective of use or appearance.” As landscape designers, we know of many other different textures, colours and styles of ground cover, and I would like to think that the precepts she set out in Chapter 19 will be remembered with enthusiasm.

Jenny Graves

Exploring Religion

John Wren-Lewis

The promoters of the Festival of Light are trying to recall the nation to religion in the hope of re-establishing the good old-fashioned values of sexual "purity", respect for elders, loyalty to Crown and Country and such like. Movements along these lines have been going for some years in the U.S. Yet at the very same time, it is possible for the American historian, Theodore Roszak, to write a best-selling book, *The Making of a Counter Culture* (Faber), arguing that recovery of religion is the fundamental import of all the current protest movements *against* the traditional values of our culture. It is no accident, he contends, that rallies about civil rights or Vietnam tend nowadays to be accompanied by religious songs, mantra-chanting and mystical acid tripping: the basic protest is no longer against any one political system as such, but against technocracy and the worship of materialistic economic expansion, which characterise both capitalism and totalitarian socialism alike.

Any serious attempt to assess the future of religion must start by coming to terms with this paradox, and the first thing to recognise is that in essence it is not new. There have always been two radically different kinds of meaning attached to the word "religion", cutting right across all the variations of creed and organisation – on the one hand, the appeal to *belief* in the supernatural as a source of moral and social authority, and on the other, the attempt to extend the frontiers of human *experience* beyond the limits of everyday material existence by meditation, psychedelic substances, ecstatic dancing, orgiastic sex, asceticism, communion with nature, or any other means that might suggest themselves. But in all ages prior to our own, this distinction was commonly obscured by the fact that the second kind of religion was almost always a minority movement contained within a general structure of organised authority-religion governing social life as a whole. Today, for the first time in history, we have a civilisation in which authority-religion has lost its hold on vast numbers of people's minds, with the result that the desire to explore religious or "supernatural" experience can be seen as something in its own right, not necessarily tied up with authority-religion at all.

The clear focussing of this point is in my view one of the most important social needs of our time, for the desire to explore "inner

space" is a vital human drive, and appeal to it is one of the strongest weapons in the hands of those who, like the Muggeridge/Whitehouse/John Birch Society axis, want to seduce us back into subservience to authority-religion. Indeed, I suspect that most of these people are themselves victims of this seduction whose support of reaction springs more from muddled thinking than from any conscious fascistic intentions. I find it hard to see the ones I know as cynical manipulators playing deliberately on people's religious feelings simply in order to uphold the social *status quo*. Indeed, I see the same tendency to assume that religious feelings can be satisfied only by putting yourself under some authority-system, in many people whose (present) orientation is clearly anti-establishment, like the Jesus-freaks in the U.S. and, in a different way, Theodore Roszak himself in the final chapters of his book, where his anti-scientific feelings seem to lead him to abandon the experimental spirit in favour of a wish to return to tribal ritualism based on revelation.

Of course, it is any individual's privilege to decide that he wants an authority-system in his own life: the danger with religious authority-systems is that they carry a sense of universal import, evoking the desire to impose the system on others, and can appeal to powerful, deep-seated human feelings in doing so. I believe the constructive way forward in our present situation is to bring this whole issue fully into public consciousness, not just by general analyses in books and articles but by encouraging really honest, probing discussion of religious questions throughout society, getting behind intellectual arguments to the feelings which give them their force. For the past four years I have been trying to show in practice that this is the most effective approach to dealing with religion in one particularly important social context, the school, and the results have been most illuminating, as I have tried to show in my recent book *What Shall we Tell the Children?* (Constable).

The task of trying to explore what religious issues really mean to people demands intellectual and emotional honesty, imagination, and openness to the possibility of meanings quite different from those we ourselves have hitherto taken for granted in either accepting or rejecting any particular tradition. During the decade of the 1960's there began to develop in the United States a movement for introducing these qualities into the whole process of education, although the primary emphasis was not on the academic education of children so much as the emotional education of adults. It has come to be known as the "Human Potential Movement", and in the

late 1960's it began to spread to many other countries. It might best be described as an attempt to take some of the leading insights of psychotherapy out of the consulting-room into ordinary life. One of its main manifestations has been the creation of "encounter groups" in which ordinary people with no special psychological problems try to help each other achieve emotional growth by getting rid of artificial defences, abandoning habits of rationalisation and self-justification, and openly acknowledging feelings of need, dependence, fear, resentment and so on. I have found that some of the techniques developed by these groups can be of great help in any discussion about religion, for if such discussion is to be at all meaningful it must be a real encounter between the people involved.*

In particular, I have found my discussions enormously helped by the basic encounter-group rule that anyone who takes up any kind of dogmatic or ideological stance should be challenged to say openly what that stance is "doing for him" personally. In most ordinary encounter-groups the stances in question are not usually religious at all, but they are often ethical. For example, in one which I attended I expostulated "I believe people ought to control their anger; it's only this that distinguishes us from savages". I was then pressed into admitting that I had all my life held back my own anger from fear of provoking anger from others, because my mother had brought me up with a quite inordinate fear of even the tiniest physical hurt, which made me anxious to transfer all conflicts to the level of abstract argument where I could beat almost anyone. This revelation has totally transferred my subsequent discussions of the question of violence, quite apart from its practical value in making me realise that in many cases people treat me with more respect, not less, if I allow feelings of anger to show.

In another group, a young physicist asserted "Science is the only reliable guide", and when challenged was forced to admit that he had from his university years taken refuge behind the label "Scientist" as a way of gaining an authority which he felt he otherwise lacked because he came from a very poor home, had a working-class accent and believed he looked unattractive. The other group members then went on to show him that his defence-mechanism was largely unnecessary and in any case totally ineffective: he would be treated with respect precisely insofar as he carried some personal authority of his own, which to some extent he had already achieved

*For an introduction to the Human Potential Movement, see Gustaitis, *Rasa, Turning On* (Weidenfeld and Nicholson), Schutz, William, *Joy* (Souvenir Press) and Jourard, Sidney, *The Transparent Self* (van Nostrand).

in spite of the limitations of his background and superficial appearance, whereas the stance of "Scientist" in itself gained him nothing worth having. This led him both to take more trouble about his appearance and personal attitude to others and, incidentally, to be far less rigidly dogmatic about scientific materialism.

Our normal tradition of academic teaching and discussion tries to separate questions of truth and falsehood from "personal considerations" like these, but during the present century it has come to be recognised not only by psychologists but also by philosophers and logicians that an absolute exclusion of personal considerations merely renders discussion useless. For example, logical analysis shows that general philosophical propositions like "Mind is merely a by-product of the brain" can be neither true nor false in themselves, since it is necessary to know the full context of a statement before its truth or falsity can be determined. In this particular case, a brain physiologist engaged on examining the mental effects of stimulating the brain with electrodes would be perfectly justified in treating mental phenomena as by-products of physical events in the brain *while he was actually doing his work*, whereas poets talking about "the marriage of true minds" would find it quite irrelevant to do so, a spiritualist would be out of business if he did so, and a Jungian psychologist believes his patients get better if they think of "mind" as something that pervades all nature. Hence the proposition "Mind is merely a by-product of the brain" boils down in practice to something like the assertion "We can trust what brain physiologists tell us about human behaviour, but many of the things poets, spiritualists and Jungian psychologists tell us are quite untrustworthy" – and it is on this kind of level that evidence for or against the philosophical proposition about mind and brain should be considered if the discussion is to get anywhere. To apply this principle fully, especially to propositions like those of religion (or politics) whose emotional overtones can often be very strong, I believe it is necessary to go beyond the kind of general considerations of "practical meaning" that the logical philosophers deal with in their textbooks, and to carry the question "What exactly is this belief doing for you?" through into the everyday lives of all of us.

The tradition of trying to separate teaching and discussion from "personal considerations" was mainly concerned with avoiding "argument from authority" on the one hand ("this is true because our forefathers believed it and who do you think you are to contradict them?") and the dismissive *argumentum ad hominem* on the other ("you only believe in hereditary intelligence because you

are a filthy snob"). The encounter group movement is equally anxious to get away from these kinds of argument, but it does so, not by trying to "raise discussion above the level of mere personalities", but rather by insisting that every individual must be responsible for his own statements and has no right to thrust them on anyone else. Thus if any member of an encounter-group makes a statement about another, like "now you are being hostile", he is made to "take full responsibility for it" by changing it to "I *feel* you are being hostile." The same applies if he makes a general appeal to authority, like "but nobody believes in astrology nowadays" or "everybody knows that Jung's psychology has superseded Freud's": he is made to change the statements to "I feel anyone who believes in astrology – and specifically you over there who have just used an astrological term – is silly", or "I feel Freud's psychology is too restricted, or too messy, to apply to me." If anyone in the group uses an *argumentum ad hominem*, like "you're only criticising me because I remind you of your father", or even "you remind me of my father", he is challenged to recognise that he is actually "putting the other person down," by saying in effect "I'm not taking you seriously at all". Psychoanalytic interpretations are discouraged for the same reason: the group I have just mentioned challenged me to ask *myself* what my pacifist views were doing for me, but if any other member had tried to *interpret* my pacifism as a defence-mechanism he would have been asked why he was trying to put me down by explaining my statements away instead of listening to them. Had someone felt strongly that he wanted to press the point, he would have been told to take responsibility for his statement by saying "I *feel* you are using pacifism as a defence against fear of violence", and I would have been free to reply "That's your privilege". It is by using safeguards like these, I believe, that a discussion about emotive subjects like religion can be meaningfully personal without degenerating into slanging-matches or blind assertions of authority.

Another encounter group technique which I have found of enormous value in bringing out what religious and anti-religious notions really mean to people is the deliberate sharing of fantasies. For example, in one group of senior schoolchildren with whom I used this approach, we came to an *impasse* because some people simply couldn't take the idea of hell or of a wrathful God seriously, whereas the others couldn't see how anyone dare *not* take them seriously. It soon became clear that the former group's scepticism was not, as they had always hitherto assumed, a matter of having

greater scientific knowledge about the universe than people in earlier ages, since modern scientific knowledge was equally available to the second group, who argued perfectly logically that nothing in modern science can possibly *disprove* the idea of hell behind the scenes. I accordingly asked the sceptics to have a fantasy of dying and finding themselves up before a divine judge who condemned them to hell for disbelief. Their reactions immediately brought out the fact that they just couldn't take seriously the idea that any God who could condemn someone to hell for disbelief could possibly be super-human: hence if by some extraordinary chance such a God *did* exist, they took it for granted that "He" would be sub-human, and the duty of any self-respecting human being would be to work for "His" overthrow by man. The believers in hell, on the other hand, were taking it for granted that any Being capable of creating the universe *must* know better what is good for us than we do, however arbitrary his judgements might appear to us. So the fantasy brought out the fact that the real dispute was not about *beliefs* but between a self-confident attitude to life on the one hand and a self-doubting or "conformist" attitude on the other. It then became clear that these divergent attitudes determined which beliefs people regarded as reasonable and which unreasonable.

Perhaps the most interesting point of all to emerge from this particular discussion, however, was that the division between the "confidants" and the "conformists" cut right across the division between self-styled humanists or atheists and self-styled believers. Some of the professed materialists were every bit as anxious to have a system of authoritative belief to which they could subordinate their lives, as were the most dogmatic religionists: they simply treated the basic concepts of materialism, like "material force" or "the historical process of evolution", or "nature", as ultimate principles of precisely the same kind as the "divine laws" of dogmatic religion. Equally, on the other side of the coin, at least half the professing religious people in the group, were not really wanting to submit themselves to the authority of any system. Their adherence to the church, or to theosophy, or to Maharishi Maresh Yogi and his school of transcendental meditation, was motivated by a wish to find a road to some kind of spiritual experience. They were willing to go along with the discipline of the system on an experimental basis for long enough to give it a fair trial, but it became clear, when we really went into the matter deeply, that in contrast to the "conformists" they reserved the right to make their own modifica-

tions to the system, or even give it up altogether, if it failed to “work” after a reasonable time.

Which brings me back to the two radically different meanings of the term “religion” with which I began this article. My work over the past few years with groups of the kind I have been describing has convinced me that recognition of this distinction clears up a whole host of misunderstandings, not least amongst which are the widespread misunderstandings about the relations between religion and science. For many young people today, recognition that their interest in religion is really concerned with experiment and exploration rather than with finding a system of authority for life, brings a realisation that the central characteristic of the scientific outlook – its commitment to progress through questioning and testing – is their ally rather than, as is so often assumed (for example by Roszak), their enemy. The true enemy of exploration is dogmatism, and it is an entirely secondary matter whether the dogmatism uses materialistic-sounding or religious-sounding language. There is also little difference between the “hard” dogmatism of overtly totalitarian philosophies and the “soft” dogmatism of systems like astrology which are so designed, with multivariate interpretations of every principle, that the system itself is always vindicated no matter what happens in practice.*

On the other hand, it comes as something like a revelation to many scientifically-minded or humanistically-minded people to realise that materialism is as much a dogmatic system as the most authoritarian kind of religion. The wish to extend the frontiers of human experience beyond the limits of everyday material existence is every bit at consonant with the spirit of science and humanism as is the desire to explore the moon or to find a cure for cancer. Belief in fixed paradigms of knowledge or unalterable values for living, whether secular or religious, is a sign of the spirit of bondage, not of creative life.

*Perhaps the best example of a “soft” dogmatism in the secular world is psychoanalysis, especially in its dream-theory, which cannot be faulted because any disagreement with an interpretation is put down to “resistance”. See the devastating analysis by Ann Faraday in *Dream Power* (Hodder and Stoughton), which also incidentally contains some fascinating material on dreams as gateways to religious vision.

Comment:

Doomsday Syndrome or Doomsday Reality

Whoever the statistics show the median reader of T. to T. to be must be wondering how the elitism of scientists ever became a problem if Mrs. Rose's "Anti-presidential address" is a typical product of it.

Perhaps it was slapped together during a tea break at the Brit. Ass., in which case some of its sloppiness should have been taken out before its wider publication. Let me make three tiny points:

Highly misleading statistic. To say that 78% of the U.S. Science budget goes to defense is absurd unless you make clear the structure of the research supported by that money. The best example to cite, from my side, is all the pure mathematics supported within that 78%, which has no conceivable present or future destructive power. The fact of the matter is that the U.S.A. has a different *tradition* of supporting research, and things that would be supported by some other Government department in the U.K. are funded by Defense over here.

Silly choice of examples. I have in mind Mrs. Rose's "oppressive and dangerous technologies like CS or an ABM system". They are about the worst two examples Mrs. Rose could have chosen to support her case (personally I think there are much better ones . . . germ bombs, for example). The ABM system is neither oppressive nor dangerous, merely outrageously expensive. Mrs. Rose may not have followed, nor may she accept, the complex arguments to the effect that an ABM system hardens one's defenses significantly and so makes nuclear attack unthinkable, simply because it could not possibly succeed. But the arguments cannot be simply dismissed by describing the ABM as if it were an Aggressive weapon. Again, in the case of CS gas, it may be extremely unpleasant, but it is silly to seize upon a weapon that was deliberately designed NOT to kill people, even if it had been shown (which it has not) that in rare cases it did kill. The fair comparison of CS effects is with those cheerful volleys into crowds by the Parachute Regiment.

Utter confusion of aims. What is Mrs. Rose really after, I asked myself, because I'm sure that if I could understand it, I would agree with it, as I did with her description of American war technology in Vietnam. Some of what she said seemed consonant with my "Electronic Bureaucrat" that appeared earlier in last April's

T. to T., but then came her sideswipe against “mechanical marxism”. She seems to want both “science for the people” and “the mobilisation of scientists”, even though these two have nothing to do with each other on the face of it. The latter, she says, is “a precondition for revolutionary changes in society”. Well, really. That’s skipping from elitism to delusions of grandeur, for if the revolutionary history of this Century shows anything it is that scientists have nothing whatever to do with such changes. Can you imagine even a footnote to scientists in “Ten days that shook the world”, for example? Again “science for people” is alright so long as you, the scientist, know clearly what the people want and will not allow any of their own little preferences to sneak in. Mrs. Rose just *knows* that the people don’t want “Concorde, Blue Streak, RB211, the British H-Bomb” whereas my lightning straw poll of the two Englishmen within reach, and my memories of polls among the 55 million, show they DO.

Perhaps the people are always disappointing in the end, and scientists, even the best intentioned of them, are incurably elitist. It’s an occupational disease. And in that case what we should be thinking about is subtler and more sophisticated ways of exercising social control over scientists (subtler than re-educative digging and cane-cutting, that is), rather than appealing to their consciences at their annual outing.

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Old Age

I was much interested in the discussion on Old Age in the October issue of *Theoria to Theory*. Moreover in the editorial it was asked how much biological and psychological study had been made of how vitality is maintained in those who go on doing creative things in the 70’s or even 80’s. It was proposed to ask some of such people to write about how this became possible.

As one of those still writing creatively at 77 I am venturing to write without first being asked, since as it happened I had written an article “Life begins anew at 75” two years ago. This was published in May 1970 in *The Science of Thought Review*. The Editor of *Science of Mind Magazine* in California saw this and asked if he might use it. He brought this out in February 1971 to co-incide with the birthday of Abraham Lincoln, on the same day as mine.

So this has already appeared on both sides of the Atlantic independently of the interest aroused by the discussion in *Theoria to Theory*.

I venture to repeat in a slightly abbreviated form what I then said to help to indicate the way in which sights can continue to be raised in spite of increase of physical limitations. May I also add that the capacity to continue working creatively long after the normal retiring age does not in my case depend on vigorous health, as there has been a good deal of illness in my life. With this introduction may I begin to quote from *Life Begins Anew* . . .

Shortly before my sixtieth birthday a doctor said encouragingly "Some people do their best work after they are 60". The idea gripped me to aim at this myself. I had had an active life lecturing and travelling round the country and after a prolonged illness was retiring with a view to writing instead. In this I sought to blend the best insights of workers in all the positive fields of work, scientific, doctors, clergy, social workers, artists and others who give a lead to the many who cannot function in these fields themselves. I wrote out of a sincere desire to help both those giving professional aid to others and to the many in need of help themselves. This was a direct continuation of the work I had been doing before through lecture work and running study circles on various levels.

The work grew as I concentrated on writing and prayer, and the range of contacts made through my writing also grew. So though it is not easy to judge for oneself, it may be true that some of my best work has been done in this way after I was 60.

When my seventieth birthday approached I found myself raising my sights again, this time spontaneously, to aim at still better work after 70. This was not just wishful thinking. It came as a result of realising how much I had learned through the discipline of these ten years and the real work that had gone into struggling to find ways of harmonising the work of many thinkers who used such different approaches that they could not always understand each other. Since we all share in one life and reality, such discordance, I realised, could not be the ultimate truth. And in some way through studying, and in a small way practising different ways of dealing with common human problems, I seemed to have become something of an interpreter. The variety of Journals for which I was writing seems to endorse this. So as my mind had to stretch to its limits to build some bridges of understanding where misunderstandings perpetuated conflict, it could be seen that there might be even better work after I was 70.

This too, has followed with a deepening spiritual insight which in some way can be realised as expressing itself as I write with a kind of resonance over and above the words that take shape, as I listen for the harmony I know must be there, however far it may seem from the surface of our minds. This resonance is something that is given, not a personal achievement but an interpenetration from a higher level when I am open to respond. Then later, on reading what has been written I find myself still able to learn from it. Yet this is not something dictated from beyond or like automatic writing. My previous experience and knowledge is drawn upon – a theme has been focussed and yet there is more in the result than past experience alone could have foreseen.

So with this awareness that is taking shape as I write comes the urge to aim at my best work after 75.

This was focussed just before my 75th birthday by reading “the right way to celebrate the 12th February is ‘to do a Lincoln’”. The idea was to pronounce our own Emancipation Proclamation, following that of Abraham Lincoln in the U.S.A. The challenge to “do a Lincoln” went home as the aim of still better work after 75, and the urge came to inaugurate this by writing for readers who have passed their prime and can only see a steady diminishment of activities as the years go on.

We cannot compete with the physical activities of youth. We may no longer be able to compete with the middle aged who can fill their spare time after the days work with social activities. Yet there is still something to be given to the family and the community that can only come as we mature and leave the activities and responsibilities we have previously carried for others to shoulder in their turn and who can grow in doing so.

In this there should be no sense of loss, no looking backward to what we have been and what has been achieved. All that is valuable in that can be taken up into a new and wider synthesis as we continue to look *forward*. If we are truly centred in spirit then we can become ever more open to its guidance as the actual pace of living slows down, and this influence will come indirectly into all our human contacts. This is not the superior attitude of the so called “Do-gooder”. It is not an attempt to try to make other people fit in with our ideas of what we think they ought to be or do. But it encourages all to become their own true selves through contact with those who have found their roots in the Eternal, who are thus akin to the young who are also looking forward to the best that is yet to be, as our inner forces prepare for the final with-

drawal from active life, with the hope and joy of ever continuing fulfilment and adventure in the life that is eternal. This is not just ever-lasting – that would be death, a fixation at some intermediate state. It is a quickening of the being that is so rooted in the eternal that it can harmonise and integrate all the stages and phases of life into a unity that can pass through the gates of the death of the body when this can no longer house the spirit, *alive* unto God in full fellowship with all we have known and loved on both sides of the veil.

“Life begins anew at 75” means just this re-setting of our compass to be able to take death in our stride, as just the closing of one door and the opening of another into a still fuller life for which this has been preparing us.

With the serenity and hope such an attitude brings we reach out to youth, which is just setting out in its earthly life, with a measure of the continuity of all life. Youth scorns the “square” who seems to them to have betrayed the promise of life : they can respect and even turn to those who show through an inner vitality, in spite perhaps of physical frailty, they have some sure foundation for one hope that they are themselves struggling to realise. Moreover grandparents and young children often accept each other without question. But this link with the young can only come through those who are securely enough rooted in their inner being to be able to accept the “changes and chances” of this mortal life as opportunities for the deepening of an element in this which not just change and is not a matter of chance. And this deepening of our inner being in harmony with others who have sought and found some “truth in the inward parts” can be carried on to become “our best work after 60, 70 or 75”. It will take different forms according to capacities and circumstances, but it can transform whatever these may be. An old man in a poor district in London used to find the glory of God in the sunlight shining on a brass knob in the room he never left.

So may all, who feel as their body is ageing there is much they can no longer do, realise they are called to do something still greater in letting the spirit interfuse, transform and transmute any past failures – and we all have these within us – into a greater harmony that can provide a channel for the Light of the Eternal to “play back” into a troubled world the Spirit that can make all things new as it bridges the Ages and reveals the life that is always beginning anew, gathering those of all ages into the harmony of

the children of God – a kingdom to which there is no end – only ever new beginnings.

This comes with a message from one who has at times been very close to death personally and rallied, at times beyond medical expectations, because of an inner sense that my work on earth was not yet finished. This has so far been confirmed by subsequent recovery and the further work envisaged and carried out. And at 77 the way is still pointing ahead, with research work in hand which will take at least another 18 months to complete.

The value of the above here is that, as it was written before the discussion on old age, it is not biased by any attempt to support or criticise anything in that discussion. Much more that is relevant to the discussion is contained in a chapter on "*Medical Science and the Art of Healing*" in my book *Wholeness is Living: Scientific Thinking and Religious Experience*. This was published by Geoffrey Bles Ltd. in 1970 and has now been taken over by Collins Publishers, 14 St. James Place, London S.W.1.

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Review:

"Contemplating Now" by *Monica Furlong*,
Hodder and Stoughton, 1971

Monica Furlong's book is the work of a good mind and a praying mind. It is perhaps inevitably, too crowded with material, especially in the first part, and this makes it, in places, difficult to read. Some of the chapter headings – "God", "Life", seem too vast and encyclopaedic for a small book. Yet the task which the author set herself made it necessary to handle a number of great themes in a comparatively limited space. She had both to illustrate the breadth and universality of the contemplative experience, and to show that it might fulfil a deeply-felt need in the conditions of our own life. In both these directions it is a welcome and relevant book, and a small trumpet must be sounded here to greet it.

The reader who finds the first part difficult going might be well advised to read first the chapter on Prayer, which is its kernel, and then turn back and read the whole straight through. It is a wise and practical chapter in relation to contemporary need, for it combines an understanding of the value of Eastern mystical thought and teaching with a suggestion of ways in which the liturgical worship of Christianity can open into the depths. This appreciation of different ways of contribution is a characteristic of the book. She is particularly aware of the spiritual value of psychological disciplines, and especially of the work of Jung.

There are some directions in which her thought seems to need correction, or, more truly, completion. In the main part of her discussion of personalist conceptions of God (pp. 44–46) she tends too much to rejection. Where such deep metaphysical issues are involved it is perhaps better to be cautious. It may be that what is needed is a deep re-consideration of what is meant by personal being. But Monica Furlong's thought is never rigid. She herself strikes much deeper, in the paragraph (p. 43) in which she reverses the idea of projection. One of the pleasures of her book as a whole is the occurrence, almost incidentally, of these occasional paragraphs or single sentences, which strike to the heart of a matter. Such is her comment (p. 77) on "a certain resignation to regularity" in the spiritual life, or on the fundamental character of the expectation of joy – "the most precious possession of human beings" – in the

contemplative state. "Contemplation is essentially a state that expects joy" (p. 111).

There are two aspects of contemplation with which the book does not (at any rate explicitly) deal. She shows how the stillness of contemplation can be reached through art (pp. 102–5). But there is also a valuable preparation for it in the rhythm and regularity of the ordinary operations and skills which make the main pattern of everyday life. To be well done, they require something of the contemplative qualities of attention, close observation, undeviating patience and regularity. These have always been needed, but never more than today in our industrial and technological age. In our inevitable preoccupation with the tragic disorder of the world, it is important to remember this store of careful and delicate work, carried out day by day, on which we all depend. The daily work of the human race is part of the seed-bed of contemplation. But the bond between the state of contemplation and research is still closer. In all deep forms of research there are phases of creative stillness in which intuitions are released and hypotheses form.

The other omitted theme is of fundamental importance but perhaps needs a book to itself. When we place ourselves in stillness we are not only seeking vision but exposing ourselves to infinite power and light. The effect is, by degrees, to show us ourselves as the marred or under-developed creatures that we are, and the injury we have done to others. In all mystical teaching, not only in Christianity, the process of purgation is realised as a necessary part of the Way. This is perhaps the reason why the experience reached through drugs – on which Monica Furlong writes with clarity and judgment – is never completely fruitful. It may not be unreal, but it is obtained in a condition which diminishes personal responsibility and the functioning of the will. Unless the remaking of the self is taking place continually, the Way of contemplation can be very dangerous.

Both these aspects are implicitly suggested in the valuable last chapter, the first in what is said about the rhythmic quality of everyday life, the second in passages (particularly pp. 118–119) which touch on the effects of contemplation. But the whole process of conversion, *metanoia*, total re-orientation of the self towards the Light, needs to be deeply examined in relation to the contemplative life. There may be another book to be written; and perhaps Monica Furlong will write it.

A. K. Clarke

Sentences:

From "New Lives, New Landscapes" by Nan Fairbrother.*

In all our new landscapes we need to use our new methods more imaginatively for despite the cutters-and-chemicals revolution we still mentally inhabit the hook-and-scythe era, and are blind to the new possibilities of our powerful new tools. We now have magnificent earth-moving machines for instance, yet we still do very little land-shaping, and our early ancestors with laborious bone shovels were far more ambitious earth-shapers than we are. What have we to compare with Silbury Hill or Maiden Castle? or even, considering our resources, with the man-shovelled land-forms of the eighteenth century parks?

We have the tools but not the imagination to use them, and have scarcely yet started even the obvious mundane uses – earth-banks as sound baffles for instance, or shaped ground of scooped hollows and piled-up mounds to screen intrusions. And why not large-scale informal ha-has as barriers to straying but not to looking? The new recreation areas, including footpaths through farmland, will need new-style boundaries which contain us without fences or loss of view, and ha-has do exactly that.

* * * *

Man's activities create special habitats which wildlife is quick to find. City reservoirs are well-known bird sanctuaries, there are herds of wild gipsy ponies in London's Lea Valley, pheasants call from the derelict iron workings at Scunthorpe, the dirty mud of Teesmouth is famous for its wading birds, jackdaws and Welsh poppies flourish in Lakeland car parks, as do carpets of wild flowers on any waste land – one area near central London is blue with wild larkspur. Whether or not we encourage the process by nature reserves our intentions are unimportant to wild life ready to help itself. Nor is it our presence which drives away other creatures but our behaviour, and it is possible we may now be starting a third phase in the relationship between men and other animals. The first idyllic Garden of Eden state of mutual trust was long ago over (except between penguins and explorers on polar ice). Elsewhere arrows, guns and the rest taught animals to flee man the killer; or if they

*Quoted with kind permission of the publishers, The Architectural Press Ltd.

were slow learners then they disappeared – like the Right Whale, so called because it made no attempt to escape and was therefore the right one to find (it also had the added merit of floating when dead). Wild life still suffers man’s atavistic hunting instinct – for fun if not for food – but there is also the mothering urge to tame and feed, and in communal areas the taming predominates (a rare case of crowds being more civilised than individuals).

* * * *

Natural conditions everywhere must now include man, but that need not mean only man the destroyer as it has in the past. In the beauty of nature reserves like Beinn Eighe near Loch Maree we can see how much we have lost by man’s destruction, and Dudley Stamp quotes J. W. Watson on the vanished scenery of the Highlands. “The primeval landscape has through time been almost obliterated. Still we can glimpse its general outlines, the forests of oak that carpeted the lowlands, broken here and there by healthy crags and cliffs, or by gleaming marshes; the forests of pine and birch that swathed the hillside . . . and moor and heath contending on the mountain”. He deplors the present desolation as “a true and terrible mirror” of man’s exploitation, but it is now possible to hope that the worst is over, since at any level of reckoning the future will find most profit in preserving the natural beauty of the uplands. And if we choose we can use our increasing knowledge and control to reduce our human impact on the natural habitat and to limit the man-made factors which now govern the upland landscape. Geneticists, by controlled crossing of domestic animals, have bred back a primitive type of cattle indistinguishable from the cave paintings; and in the same way ecologists, by controlled conditions, might re-create a primitive type of landscape. Already it is an unlikely concomitant of the population explosion that just as farmland is emptier so the wilderness is wilder than it has been for centuries . . . The large areas of land with no future ground-use may well return to a state approximating the natural habitat, and our new industrial economy may in fact answer Gerard Manley Hopkins’ plea for the Highlands (in what so far as I know are the only four simple lines he ever wrote):

*What would the world be, once bereft
Of wet and of wildness? Let them be left,
O let them be left, wildness and wet;
Long live the weeds and the wilderness yet.*

NOTES ON CONTRIBUTORS

Freda Wint read English Literature at Somerville, was a principal in the Board of Trade, taught for the British Council in Turkey, was a journalist in India, where she worked for the Manchester Guardian and met and married Guy Wint. She has been a Buddhist for twelve years and has practised meditation under a teacher in Thailand.

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W. Grey Walter read physiology at Cambridge. His main work has been in Neurophysiology and Electro-encephalography, and he is now Scientific Consultant at the Burden Neurological Institute in Bristol. He is author of "*The Living Brain*" and a number of papers on Neurophysiology, Electronics and Cybernetics.

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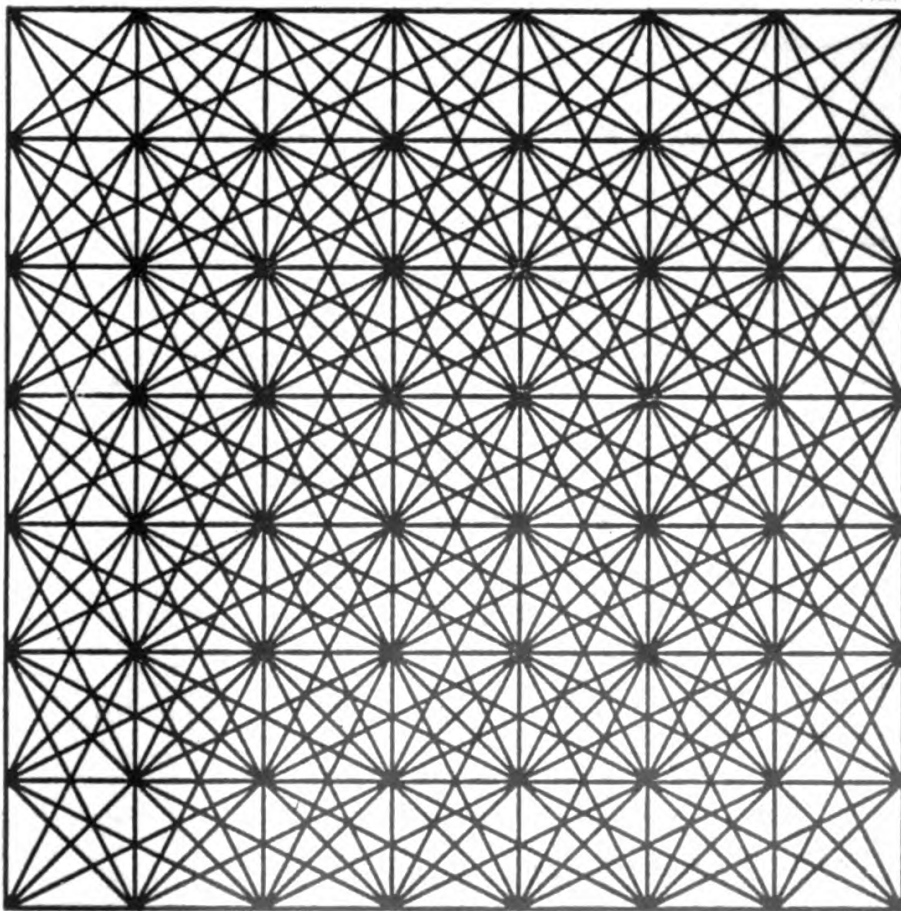
D. P. Henry, who designed the cover, is a Reader in Philosophy and author of several books and numerous articles, mostly on medieval logic, and is also an experimenter in various art media, with machine graphics as his main interest. Since his one-man London show "*Ideographs*" in 1962, he has had several other exhibitions, and has contributed a machine and graphics to the Institute of Contemporary Arts' Exhibition, "*Cybernetic Serendipity*", which toured the U.S.A. after opening in London in 1968.

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THEORIA

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Volume 6 Number 3 July 1972

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Editorial

A case has again to be made for what someone called our perverse and apparently ineradicable concern with Christian devotion, because it seems inappropriate for a group which is about to run a colloquium on the problems of the assessment of way-out research.

Apart from what could look like the whimsicality of sticking to tradition for the sake of tradition, we might seem to be in danger of prejudging several fundamental issues by having a special relationship with one particular religion, and that Christianity.

When we started, more than five years back, "The Christians, a declining band, pointed with monitory hand" at the then Bishop of Woolwich and his pals "and said, you mark my words, something will happen to those birds."* Those possibly, however, were the reactionary remnant who still had the quaint idea that Christianity is meant to be fundamental truth about the world. They were shattered, though, by the attack. We sided with them. We took the line that if one had enough faith (Faith!) to think scientifically about the universe of mystical fact then one would be nearer to having a reasonable picture of the whole of things than if one accepted a science limited by the atomic picture of separate units distributed in a classical space as the reality to which our thought had to reduce everything.

Now things are different. One way or another this scientific paradigm which held sway for so long and imposed its particular metaphysic, invulnerable to rivals by presenting it as common sense (which has no rivals), is no longer the tyranny it was. (Its tyranny consisted in its making no sense to discuss alternatives.) Scientists must now keep a straight face when talking of acupuncture and water-divining which had long been dismissed as fairytale, and many people have the thought of reincarnation as a possibility somewhere at the back of their mind. For many, this thought is a buffer between them and ultimate meaninglessness.** In the new climate Christians have happily relaxed with the thought that in

*With acknowledgments to Hilaire Belloc.

**There is something odd here, though. In the Buddhist East the notion of a succession of lives goes with a sense that this is a pointless kind of existence, and the point is to learn the way of getting released from it. In the West people are taking up the notion that this life may be preceded and succeeded by others as giving it a point.

some way that they need not bother to formulate, they had been right all along.

However, to make the case for Christianity being the peculiarly appropriate tradition for a world newly obsessed with “inner space” is not our present aim. We have rather to make the case for taking some single tradition, at its deepest, as a necessary complement to the scientific investigation of the universe of mystical fact. The scandal of particularity (to adapt a phrase) that we seem to be inviting with this proposal is really a concession to the limited powers of human comprehension. We make the best of a bad job. The person surveying the mystic scene has two rôles; first as the external observer describing what he finds, and second as the experimental animal. Somehow these two rôles have to be integrated, but here lies the difficulty. Excellence in these two directions has only ever been achieved through training in two quite separate kinds of discipline – one philosophic (in the old general sense) and the other directly experiential (the person with the greater mastery communicating as best he can with others so as to bring them to his condition).

The second of these kinds of training, where you use whatever form of communication serves your purpose in an almost pragmatic way, has been the background against which the devotional languages of the religious traditions have evolved. One aspect of this growth of devotional language is its widespread involvement with personalism – the attribution of personality on a human analogy to general or universal powers. It seems possible that human mental facilities are so well adapted to dealing with other persons, without thinking what mechanism they are calling into action, that much the easiest thing that the mystical trainer can do is to utilise this very accessible facility in designing forms of meditation. There is an analogy in the way subjects have acquired the ability to meditate by deliberately cultivating those sensations which produce the same electroencephalograph pattern as that exhibited by an experienced meditator. If it works, fine, but we do not expect any simple relation between learning how to meditate and the objective description of the phenomenon of meditation. Christianity particularly has tried to jump the gap between the two forms of training by reinterpreting its metaphysics in terms of personalities. (Uncreated energy, logos, pneuma become God the Father, God the Son and God the Holy Ghost.) And in the past in this journal we have fulminated over the “sermon talk” which results when

this enormous jump is treated as though it did not exist and this kind of language is taken for granted without explaining its use.

Our contention is that the human race is not in a position to replace the pragmatic devotional language by real understanding and so to draw together vision and experience. The Christian faith may hold the promise of an ultimate *visio Dei* where this imperfection is transcended, but all it or any other faith can offer that is firm is a second discipline of development of the personality which can be seen to lead far beyond what is generally considered normal.

Madame Vinay, who has known Simone de Beauvoir from childhood, writes in this number about the latter's view of old age, as given in her book which has recently come out in an English translation and received wide attention. Madame Vinay is not just confronting humanist assertions about human life with Christian ones. She is saying that this humanist view, even in such an exceptionally intelligent humanist, shuts its eyes to actual facts about what remarkable old age can be like. (See our discussion of this in T. to T. V iv, particularly the note by Julia de Beausobre.) So to take account of the religious dimension is not just to introduce a prejudice. It is to call attention not only to transcendental possibilities, but to facts – empirical facts – which the humanist is ignoring. In situations like this science is too important to be left to the scientists.

* * * *

Our cover design was supplied us by I. J. Good. It shows a functional chess board, where the lines will be found to represent the possible moves of the pieces.

Discussion: *Personal Factors in E.S.P.*

George Owen, Director of New Horizons Research Foundation, Toronto. Paul Beard, President of the College of Psychic Studies, London.

George

About two decades ago investigators were saying, "If only we could get some high scoring subjects". It seemed to me they had at the back of their minds a genetical theory with extra-sensory perception as an individual characteristic like having red hair or blue eyes, but rather more rare. A few years later people were saying "We could make some progress in understanding extra-sensory perception if we had a way of making people into high scoring subjects", and the way they had in mind was either meditation or the use of some special chemical or drugs. Well, somehow all this did not quite come off. A lot of things were said at the time, such as that under hallucinatory drugs people did have more abundant parapsychological or E.S.P. experiences, but in my view such evidence as was ever quoted was very anecdotal, and has really not been scientifically validated. In any case there were several undesirable things about that movement; firstly it seems to me quite wrong to use for one purpose a drug which is taken for quite a different purpose; if they wanted to advance this they ought to look for a tailor made drug that did not have other effects. It also seems to me that the argument was mixed up with another traditional point of view that depended on an entirely different theory – namely that extra-sensory perception is correlated with a particular state of consciousness. This is a very old tradition, and it goes back a very long time; some of the earliest work on clairvoyance was done by the mesmerists and then by the hypnotists who introduced the idea that extra-sensory perception functions best in certain states of consciousness. Then again there was the theory that medication or biochemistry might be the clue – an idea very closely related to the old theory of spirits of consciousness. The drug episode in our culture was very interesting but has a lot of hazards of its own, so there is a general move, quite apart from parapsychology, to find a substitute for the drug experience. Where I live now – Toronto – is a great centre of drugs, unfortunately, and a great centre of mystical and meditational func-

tions. A lot of people are very sincerely looking for religious experiences of a mystical or meditative type. Meditational techniques and mystical religion are being seen as substitutes for the drug experience. This has saved many young people from getting involved in that, and is a less harmful way of perhaps getting some of the positively good insights that some people do get with drugs. People are looking for hope in promoting extra-sensory abilities from things that roughly could be called relaxational meditative techniques. There are a lot of courses to teach people to get into states of mental relaxation at will, and this of course is mixed up with the interest in the alpha waves. When you are in a sufficiently relaxed state your brain goes into a particularly elementary sort of electrical wave which is called the alpha wave. This of course correlates again with the old state of consciousness approach to E.S.P. and there is a general observation that a great many people's spontaneous E.S.P. experiences, telepathic, clairvoyant, occur of course during sleep but also in states when they are slightly absent minded, or very tense. So one of the things we are just beginning to nibble at is testing whether the techniques of some of these groups that are teaching things like mind control, or mind dynamics, or alpha wave methods, don't actually conduce to extra-sensory ability. I think this is a promising field.

Paul

That is a very nice survey to start us off. I am not a scientist and therefore necessarily have to be less concerned with experiment. I am really more concerned with *experience*, and particularly in trying to find out how far the experience of E.S.P. and its contents can be related to various levels of consciousness and, of course, how a discarnate person or the evidence of discarnate persons comes in. My own view is that I accept the hypothesis that we survive death and – a quite different thing – it is my personal belief we do and that it is possible to make contact with discarnate persons, and I look on this as a delicate and difficult and highly interrupted form of human relationship. Nevertheless I feel that it is a form of human relationship which has great possibilities. I am extremely concerned to try and make the best of this evidence. I certainly feel that the recipient plays a larger part in this experience than is usually supposed. After all he is one end of the human relationship. In the middle you have a person in the shape of a sensitive as a professional. Ideally of course one would hope to extend one's level of

consciousness in whatever way is found to be appropriate, and then have a direct communication. I take the view personally that there is no hard and fast line between ordinary social sensitivity such as we all practise every day and simple E.S.P. of a telepathic kind, passing on perhaps to wordless telepathy, something nearer to communion between one person and another, and then passing on again from that to something nearer to true mystical experience. That is the sort of scale in which I am interested, but of course it is an extremely frustrating and difficult field to work in. One feels, you know, that in the convent or monastery where telepathy, I understand, is a fairly common sort of by-product of the meditative discipline, one gets a lead in seeing the importance of the purity of these meditational activities, as well as the general purity of outlook of the person concerned with this field as a highly important factor. Just as you are likely to get a more refined work of art from an artist who is essentially refined, so the same thing is likely to happen in communications of this kind. A lot of our problems arise from having to use professional sensitives who are trained with something of a show biz outlook. This I find wholly deplorable and I would like to try to do something to lessen it if I can.

George

You have brought in discarnate entities. Could I have a bash at saying where I stand on that? I am not fully convinced of the existence of discarnate entities. But, if they exist we communicate with them by E.S.P. Looking at the problem the other way round, is all extra-sensory perception mediated by discarnate minds? I know a number of professional sensitives who believe that they are in touch with discarnate entities. If asked, "How did you get that message?", they say "O well the spirits told me". We know a Canadian sensitive, Mr. Wilkie. When he stays with us, he signs the visitors' book "James Wilkie and Rama", because Rama is so real to him. Sometimes you ask him a question, which he answers correctly and he will say, "I knew that by clairvoyance". On other occasions he says, "I will see if Rama can tell me". Later on, he will produce the answer.

Paul

Who is Rama?

George

Rama is a sort of spirit guide, he is a discarnate person – a deceased person.

Paul

Does he make heavy claims for himself?

George

Not very, no – relatively mild ones. In fact Rama is a bit like James Wilkie. They are both rather quiet characters. I know another sensitive who says he gets his information (whether it is called telepathy, or precognition or clairvoyance) from a cosmic source of knowledge, a universal mind. There are other sensitives who say the same thing. They may or may not equate the universal mind with God. Although I try to think within the outlook of scientific materialism, it does seem to me that many of the feats that we ascribe to extra sensory perception may have to be explained in terms of the sensitive tapping-in to a universal source of knowledge. Somehow he plugs in, or the universal source of knowledge plugs in to him. Sensitives seem to have very different methods of setting up the linkage or connection by which they can get information. There is one lady, with whom we are working, who is very good on picking up anything that is relatively homely, commonplace or trivial. She is very accurate on people's names. She will say to you "I get the name Quentin", or "I get the name Darratt", or "I get the name Walter Scott". Very often these will be real names that someone in the room has encountered or will encounter in a completely trivial connection. They will not be names of deceased relatives or important people. It is as if she collects floating flotsam and jetsam of knowledge. Things that are more deep of a psychological nature she just won't get. On the other hand we have a young man who is a very powerful medium with a lot of ability. If he is told a name like John or Peter, then he will proceed to give a description of that person which physically may be somewhat inaccurate. However when he gets on to a psychological description of that person it will be very striking. He will do this on a living or dead person. Now maybe in each case the source of information is really the minds of sitters present with the sensitive. However this difference in the kind of material produced by sensitives gives weight to what you, Paul, were saying, that the psychic person who is the more sensitive in the broad sense supplies a more

insightful kind of reading. How do you feel about a universal mind, Paul?

Paul

I feel that it is a little bit like the civil service, likely to be delegated.

George

I can't improve on that remark !

Paul

I think you would agree, George, wouldn't you, that sensitives are extremely bad reporters about themselves and the professionals particularly tend to be rich in what I would call local folklore as to their methods of working. And it is a great pleasure when you find a reasonably detached sensitive like Douglas Johnson who feels, I think with some justice, that he can distinguish reasonably well between when he is getting his message from a living person and when he has a discarnate contact, and when he is shown to be wrong it does not upset him, he does not get fussed about it or try to defend it with further folklore like so many sensitives do. They are by nature very precarious persons; their profession is precarious and they are ultra-sensitive. They have very poor means of defending themselves, and this is one of the lots we have to put up with when we are dealing with them. I imagine, though perhaps I am quite wrong, that you would say that the nearer the candidates are to the subject matter the more likely it is to be only E.S.P. How do you feel about that?

George

Yes. In the case of the sensitive who supplied trivial information, one cannot really think that it is being communicated by a deceased person. It is probably got by telepathy from one of the sitters. E.g. one lady is very good when my wife is present. So it does vary with the person, yet one feels a spirit would be impartial about that, a spirit would not bother to get trivial information more readily in relation to one person than to another. So I do agree that the depth of what is said does seem to make a distinction between pure E.S.P. and something that may involve discarnates.

Paul

Let's have another look at this chap who does the psychological

information. Now is that confined to a straightforward analysis of the psychological situation or does it incorporate advice on how it should be dealt with? Does it suggest the application of some other mind, living or dead, looking at the situation and commenting on it, or is it straightforward reporting?

George

I think it is a straightforward description of tendencies, the kind of way the person that's being described tends to re-act to life situations. It does not usually involve much advice as to how they should act.

Paul

To put it in terms of spiritualistic jargon, that is what is usually called reading in the aura. Reading in the surround if you like, call it what you like. I think some sensitives start off with this as a sort of pump priming operation and when they have done this they are able to put themselves on to some other source of information. They could clearly be touching on a deeper level than the person they are examining. As long as we don't know the limits of the human mind there always will be legitimate room for alternative theories, I do not see how we can hope to eliminate them completely.

George

I wrote down carefully what a sensitive said about a deceased person and I was struck with the accuracy of it. Some months later I got out this file of readings and showed it to my wife and there were some curious things said which I had quite forgotten at the time, and things I did not consciously know or recollect. This is very interesting. Although I was the sitter, there was nobody else in Toronto who would have known anything about this person who is fairly well known in Cambridge but not very much outside. It was months after that Iris looked at what had been said, and she scored a number of things correctly where I did not know whether they were true or not, and there were one or two things which I feel sure I never had known. So where was he getting his information from? Was his mind somehow through me tuned in to people in Cambridge who had known this person? Or was he getting it from perhaps the person himself? Or was he getting it from some universal source of knowledge? This kind of thing

is susceptible to several explanations always. I am not one of those who believes in over-simplifying parapsychology.

Paul

This question – I do not like to call it a theory – of filching by E.S.P. from unknown living minds seems to me O.K. as a bit of defensive technique, but it does seem to me time that the S.P.R., or some other parapsychological body should set about trying to devise some simple experiments to see if they could produce information in this way. My private guess is that nobody in the S.P.R. really believes it to be true.

George

We have just started doing control experiments in which one gets a layman to imitate what the psychic has done or is doing. This may not be quite the kind of experiment you mean, but perhaps it is a beginning. We are trying to collect together a scratch lot of other people, non-psychics, and then see how well they can do presented with the same stimulus of the name, or the supplementary information. I think this has been advocated by people at various times like Dr. Pratt and others. Of course a great deal has not actually been done scientifically on recording verbal responses of psychics, and it is very hard to score that sort of work statistically, but I think it is important, even though it is laborious to do and very difficult to publish because it tends to be voluminous, and you can't just put a little table of figures. It is much closer to real life; after all, all the really interesting kinds of E.S.P. are in human interest situations, either people going to a psychic for advice, or trying to get in touch with their deceased relatives, or spontaneous thoughts and impressions and visions that come to people not in the experimental situation. It seems to me that this working in the good old-fashioned way with perhaps slightly more modern techniques is an important experimental field for parapsychology and E.S.P.

Paul

I am all in favour of bringing back common human life. I think this is really E.S.P. at its best. It seems to me that if you ask a sensitive to take part in a card guessing experiment you are not giving him material that the E.S.P. faculty, as we know it from observa-

tion, is fundamentally interested in. Would you agree with that, George, or not?

George

Yes, I very much agree with this; I think there are human emotion factors, I mean not bad emotions but valuable human emotions, involved in E.S.P. situations. I came into all this subject about 20 years ago for one very limited aspect, studying poltergeists, and I was interested in their being highly concrete; if something moves, it moves, and one has not got the statistical problems of interpreting mental phenomena, and gradually and inevitably this got me prejudiced on the spontaneous side rather than the experimental side, and I still think you can experiment with spontaneous things if you have experiments which retain opportunity for spontaneity. For instance we have got an informal group where we may get perhaps a dozen people in and then tempt the sensitive to say "come and do an experiment tonight", and we all get together and we try to get a slight spirit of fun, and, although the idea of the experiment may have been carefully put together to some extent to try to get something that the sensitive will enter into and be suited to him or her, it is a sort of hybrid kind of situation, half experimental, half spontaneous, half serious, half fun, and of course the experiment that comes out is never perfectly designed. How could it be, if it involves an impromptu element? On the other hand it is not so perfectly negative as many perfectly designed experiments are; sometimes you learn new things, sometimes you find out things you never thought of before, about new aspects of the subject.

Paul

That makes a much more realistic kind of experiment.

George

It is sometimes said that these powers might be more prevalent if people really did depend on them for communication, in primitive kinds of society for instance where you have not got telephones and all the things that we have and these powers could serve a biological need – do you think there is anything in this?

Paul

I think there could be.

George

I know a friend of mine who was making a film amongst some bushmen – I do not know whether they were bushmen in Africa, or bushmen in Australia, or wherever they have bushmen. Somebody had just gone off for a day in the bush hunting or something, and he was wanted back, so they all sat round in a circle and concentrated – sort of “Come home, Fred, come home”, and after about half an hour this little man came rushing out of the bush with a shout of “Was there something?”

Paul

Could we come back to the notion of a universal mind? If you have got a universal mind, by which you mean a reservoir of information somewhere, that is a bit different from an entity, from a mind, isn't it? A memory bank is not automatically a mind. Of course it is very difficult once you start playing with memory banks, then you find you usually have to put in additional important assumptions like that the memory bank is capable of selecting the information it gives you, in which case you might as well call it a mind. But what is motivating me in this point is that in spite of your saying you were impressed by the richness of the evidence about this field I suppose as a scientist you are concerned to work to economise on hypotheses. You go as far as your given hypothesis will take you and then you are reluctant to import another hypothesis.

George

I am very conservative myself about hypotheses. Perhaps less conservative than others but I am still very conservative though not re-actionary. You make all sorts of new hypotheses when you go from a memory bank to a universal mind – particularly if you are then going, as you, Paul, suggest, by analogy with the Civil Service, to delegate functions to limited minds. The problem seems to me – how do you plug in?

Paul

This was Fred Myers' famous question, wasn't it, after his death (excuse me assuming it was Fred Myers, it is so much simpler). Who selects? This is a very potent query because one of the ways in which discarnates show evidence of themselves is by the kind of

topic they suggest – not only in terms of memories but in terms of subjects in which they were concerned.

George

They choose something of interest to the sitter.

Paul

A topic of mutual concern, of mutual compassion perhaps too. It is hard to deal with the universal mind without importing compassion at some stage of it, compassion on the part of the universal mind itself, or whoever is standing in for the universal mind, towards the human situation on which it is commenting.

George

Oh I see. Well that is imputing a terrific lot of intelligence to it. You could impute much less than that and you would still have to call it a mind; as soon as it is selective at all, then it is a mind and not a memory bank.

Paul

Presumably it could be a memory bank from which a mind selects. Thus if you talk for instance to Douglas Johnson's control, I am sure he would say that if he wanted to consult someone else's part in the Akashic record (which is what some people call the universal memory) he would have to ask permission from the custodians. I think by that he means that there has to be some sort of resonance or some sort of rapport before it can be done. Not everybody can link onto everything else. I suppose many psychics would say this is how psychic work is done, whether it is E.S.P. or whether it is the other aspects.

George

This sounds exactly like a computer design to me. These are just the problems they have to deal with; how do you preserve parts of the store for certain types of use and how much information is available and what are the access times and so on. There was one point that hit me in the discussion when we were talking about interest being a necessary ingredient. Sometimes it seems to me that it is often more than interest, it is some sort of passionate concern for the particular problem which is productive. Of course

kinds of rather disastrous passionate concern produce ghosts and poltergeists; there seems to be some evidence of this.

Paul

We are back in the human situation.

George

The techniques used by the sensitive, and the psychological apparatus that they use, need to be watched very carefully – constructing for themselves alleged discarnate entities may surely be a very important part of the build up, so you have got to be very careful at what point you say there was really a discarnate entity, whereas what is really there is perhaps a very powerful sensitive drawing stuff from all kinds of sources – perhaps even including the memory stores of people who are dead which they fit round particular figures, which possibly are in themselves imaginary, and not real existences at all.

Paul

They are a crystallizing point of something, aren't they?

George

Thinking as an experimentalist, I suggest two fields that I think are very important. One is a question of the effect of distance on communication. An old friend of mine went round the world, to see the effect of distance. That is rather a nice sort of experiment, but it is much simpler and much less expensive to use the telephone. We have started doing that over small distances like 10 miles, 400 miles, and even a telephone call between England and North America – it is not all that expensive, you can get an experiment on for a few pounds. This I think is important because innumerable papers have been written comparing telepathy to radio and as soon as one does any experiments that involve distance, it seems that it is much more like using the telephone. You know there really does not seem to be any effect of distance at all as long as there is some kind of emotional mental rapport between the sensitive and the recipient. It is very much like S.T.D. dialling, I feel, if somehow each end knows the telephone. Another thing I want to say is that really any study of the subject that does not pay attention to precognition somehow must be leaving out a very important piece of the whole puzzle, possibly the most important.

But we can't start on that one now, and it must wait for another time, just as I think your view of discarnates, Paul, is something we ought to go into more closely some other time.

Paul

Much of the richest part of the E.S.P. material – the Leonard corpus, “Swan on a Black Sea”, a good deal in the cross-correspondences – is interwoven with evidence for survival. That is why I don't think you can leave it out for long.

The Neural Basis of Conscious Decision

John Griffith

(John Griffith, Professor of Applied Mathematics in the University of London at Bedford College, died in April. He was a collaborator of our group, and contributed an article on "Brains and Computers" to T. to T. II, i. This present article is his inaugural lecture, given at Bedford College in 1965. We are publishing it, with the permission of the College, as a memorial to him.)

I am often asked: "How can you apply mathematics to the brain?" There are several possible kinds of answer to this. One is rather trivial and is to say that whenever quantitative measurements are made in science, the interpretation of these uses mathematics of some sort. An electroencephalographic recording is a familiar example of a quantitative measurement on a brain and the technique of Fourier analysis is often used on such recordings in order to show the presence of periodic phenomena such as the well-known α -rhythm. Much recording is also done of the activity of single cells of the brain and, in the analysis of such records, the theory of statistics is often necessary. And one could enumerate countless further examples.

But is there any deeper way in which mathematics can assist in the study of the brain? Here I think the answer is yes, that any theory of the brain must be at least in part mathematical and that mathematical intuition and technique must be helpful in the creation and analysis of it. This is not to say, as some do, that mathematics in isolation can contribute much to a theory of the brain. Rather it is that if you wish to understand the brain, I think you are wise to acquire, in addition to as much knowledge as possible of anatomy, biochemistry, neuro-physiology, psychology and such biological fields, also some feeling for the approach by an applied mathematician to complex systems.

With the brain, it is neither obvious what are the central questions to ask nor how to answer them. In this lecture I shall mainly discuss one, which I consider to be an important and an essentially mathematical question. In fact it seems to me to be a key one for an understanding of the general principles of operation of the brain. Then I shall attempt to clarify the question by considering

a specific example. It may be interesting, also, if I expound, in passing, some of the considerations which led me to adopt my present opinions.

Before we pass on to the question, however, let us consider briefly what a brain consists of. The human nervous system, of which the brain is the head-most end, is made up of some 10,000 million nerve cells and also other cells. We will assume the other cells may be ignored for our present purpose.

What is a typical nerve cell like? They all have a central part, the cell-body, which houses the nucleus and much of the biosynthetic apparatus. Then the body has long tubular extensions which grow out from it, dividing and dividing again until all the furthest ramifications may easily run into thousands. The extensions are called axons and dendrites. In some cases they may be several feet in length – for example the nerve cells whose furthest ends reach into and control the musculature of the foot have their bodies in the spinal cord.

The most important characteristic of a nerve cell is its excitability. The cell is bounded by a surface membrane which is normally semi-permeable. This means that the membrane will allow certain ions and molecules to pass through it, but not others. The semi-permeability has certain consequences which can be understood by using the theory of thermodynamics. One of these is that the interior of the cell normally has a negative electrostatic potential of about -70 mV with respect to its exterior. This is called the resting condition. However, if this potential difference is artificially altered above a threshold value of about -60 mV, the membrane suddenly become permeable. A consequence of this is that the potential is then approximately equalized on both sides. This change of permeability is self-propagating – if it starts at one point, it spreads to adjacent points and so on. Shortly afterwards the membrane recovers its original semi-permeable state. Thus a transient and spreading burst of electrochemical activity is generated. It travels with approximately constant velocity along the nerve, and without attenuation. The velocity would be typically between 1 and 100 metres per second.

The passage of excitation along the surface of a nerve cell is rather like the movement of the point of ignition along a fuse, except that the nerve cell may be used again and again indefinitely, while the fuse can only be used once. True to this analogy, we often speak of nerve cells firing.

Once a cell has fired, the activity passes out to the uttermost extremities, which then spew out small quantities of chemicals called transmitters. These pass across narrow gaps, called synaptic clefts, to adjacent cells where they alter the permeability of the membranes of those cells. Any cell will receive a continual barrage of transmitter from the many other cells which are linked to it, and whenever the intensity of this barrage exceeds a certain threshold value, the cell fires.

The nervous system, then, consists of a collection of nerve cells which fire at intervals under the influence of their neighbours. It also possesses "input" cells, such as those of the retina of the eye, which fire under the influence of external stimuli, and "output" cells which control the operation of the muscles of the body, including those which are responsible for speech. These cells are linked together in a fashion partly orderly, perhaps partly haphazard and in a hierarchical manner with the head end dominating the rest.

A typical nerve cell has a number of inputs, from other cells, and outputs, to other cells. Some idea of the relation between the input to a cell and its output may be formed by considering the following simple, but not wholly accurate, description due to McCulloch and Pitts (1943). The inputs to a cell are of two types, excitatory, which increase the probability that the cell will fire and inhibitory, which decrease it. In the McCulloch-Pitts description the cell fires if the number of excitatory inputs which are active, minus the number of inhibitory ones, exceeds a fixed threshold value. The mathematician will note that this means that the relation between input and output is strongly non-linear. This non-linearity is the main origin of the great mathematical difficulties of analysing the activity of aggregates of nerve cells.

You may well ask at this stage : but is the brain nothing more than this, nothing more than a complicated sort of physico-chemical telephone exchange? Where in all this is one to find the spirit, where even the mind? It is necessary for me to state a position on this point, even though I shall not have time enough to try to justify it adequately. Otherwise when I ask how are decisions made, I shall not be able to reject the answer "because the mind makes them", even though I should not understand what such an answer meant. My position then, is simple : yes, the brain may be correctly regarded as nothing more than a lot of nerve cells and other cells obeying the usual laws of physics and chemistry; no, I do not think

we shall find it necessary to include in our theory any non-material entities, now or ever.

To those who find this distasteful, I would say a few things. Although some might disagree, I do not regard my position as having any simple and immediate theological implications. I think we are almost forced, as scientists, to make these assumptions until, possibly, they are proved wrong. It would be infinitely more difficult to think about how the brain might work if we were to suppose it to contain, as well as familiar material entities, also non-material ones of totally unknown character.

Of course, we should not adopt such a position if it were obviously at variance with established fact. I do not think it is. Those who work on telepathy seem to be greatly concerned with providing such fact. I shall not enter into the argument, largely fruitless, about whether telepathy is a genuine phenomenon or not. I could defend my assumptions about the brain by saying that telepathy appears to be normally, at most, a marginally-detectable phenomenon and is therefore unimportant. But that would be logically unsatisfactory. I prefer, rather, to stick strictly to the assumption that the brain contains no non-material entities. If this is so and if telepathic communication can occur between man and man then it can also occur, in suitable circumstances, between animal and animal and – most important – between machine and machine. In other words it is a normal, though rarely apparent, property of matter. From this point of view it seems to me that workers on paranormal phenomena would do much better to try to obtain telepathic communication between two Geiger counters or two computers with some random elements than between two men. Surprisingly, in looking through their literature I have been unable to find any consideration of such a possibility. The advantage, surely, is obvious, namely that one would be freed from the difficulty of dealing with biological material with its extreme and largely unpredictable variability.

But now let me return to my main theme. When I started to be seriously interested in the brain I was struck, and what Mathematical Physicist would not be, with the superficial analogy between the brain with its nerve cells and bulk matter with its atoms and molecules. Matter can be described at two levels, in terms of electrons, nuclei, molecules, quantum mechanics or of volumes, pressures, densities, thermodynamics; the grains of sand or the Pacific shore, as it were. And the two are connected by the theory

of statistical mechanics. The brain, too, has two levels of description, in terms of axons, synapses, nerve cells, physical chemistry, biochemistry, or of stimuli, responses, thoughts, memories, psychology. Can we not create a theory of statistical neurodynamics to relate these, too?

Although I did not at first try to do this in any detail, I was much influenced for a long time by the general idea, and in some ways still am. However, there are difficulties in this programme which are not apparent at first sight, and which I only discovered recently in connection with an investigation of the ferromagnetic analogy to the nervous system put forward a few years back by Cragg and Temperley (1954). They, you may remember, sought an analogy between the co-operation of the individual spins in a magnetic material such as iron, and that of nerve cells in brains. The difficulties may be summed up conveniently by saying that if we create a statistical neurodynamics, with the nerve cells as the fundamental particles of the theory, we cannot assume dynamical reversibility within the theory (Griffith, 1966b). As this assumption is one of the main props upon which statistical thermodynamics rests (Tolman, 1938), it means that the latter cannot be taken over in any straightforward way and applied to the brain.

Not realizing that at the time, I started to ponder about what was the analogy, in the brain, to the behaviour of an isolated thermodynamic system. Such a system passes towards equilibrium, all the macroscopic parameters tending towards terminal, unvarying values. In an isolated brain, therefore, should not the macroscopic psychological variables in any statistical theory also tend to stable, unvarying values?

The same view was suggested to me by thinking of an individual nerve cell as a random variable of probability theory, the value of the variable determining when the cell fires. The brain, then, would consist of 10,000 million random variables and any psychological variable would presumably correspond to some average over these random variables. By the central limit theorem, an average of a large number of random variables is usually, though not invariably, distributed normally with a very small variance. Therefore, unless it is artificially set to an abnormal value any psychological variable should always have essentially the same value, namely the mean of the corresponding normal distribution.

Both of these arguments suggested to me that psychological variables ought to remain fairly constant in an undisturbed brain.

Neither is compelling, for one can construct counter-examples. A third line of argument was to note that it can be shown directly, as we shall see later, that the average activity of randomly connected aggregates of idealized nerve cells will normally pass to one of a very small number of terminal values and stay there. (Rapoport, 1952; Beurle, 1956; Ashby, Von Foerster and Walker, 1962; Griffith, 1963).

But what if the implications of these arguments are true? We have not yet defined our psychological variables and cannot, therefore, yet say anything of their experimental properties. Even the term may be somewhat misleading, for the psychologist is normally concerned with input and output and usually admits to no direct knowledge of the internal state of the brain. Or, as Hebb (1949) says, he is usually interested in the relation of stimulus to response and not in what goes on in between. A simple analogy with a digital computer is instructive here. Many computers, such as Atlas, chatter away happily with the machine operators in 7 bit characters on paper tape. But this does not prove that their internal calculations, or thoughts, are conducted in 7 bit characters and nor, in fact, are they. The internal language of our brains may not match at all closely their input and output languages – for us, the English language.

However, we do have another window into our own brains – the window of introspection. There is a danger here, for who knows what is the relationship between what is really in the brain and our subjective vision of it? Nevertheless, I shall argue that in this window we can see at least one important thing.

The vision in the window is our consciousness. Some would say that one should not consider consciousness in science because one cannot measure it objectively. Others might think it unimportant for a theory of the brain anyway. I would counter both these by claiming that some understanding of consciousness is so important for any theory of the brain that we must consider it carefully in spite of the difficulties of measurement. The reason for this is that, whatever the logical possibilities, it is obvious in fact that the most significant purposive activities of a human being are foreshadowed in the consciousness immediately before they happen. Decisions are usually conscious decisions. People often talk with awe of an unconscious mind; what we should be surprised at is the extent to which matters are conscious. Then again, the things that you remember usually go through the consciousness first. In fact I

once thought of trying to define "consciousness" as "rate of change of memory".

To me, this makes it obvious that one is getting a view in the consciousness of those operations in the brain which are concerned with the highest level of control of modifiable behaviour of the organism. If this is so, then the elements of consciousness are the main macroscopic variables which should be used in a statistical neurodynamical theory of the brain, though we see them introspectively and perhaps, therefore, extensively distorted.

If we admit this, then one psychological variable must be the word. For most thought is at least partly verbal. A specification of a state of consciousness would include, perhaps as its most significant part, a statement of the word which is currently in it. A thermodynamic variable, like pressure, has a continuous range of possible values but a word, of course, takes one of a large finite range. This immediately poses us with a new problem. From the microscopic point of view, to say that the consciousness has a certain word in it is to give a partial specification of the system. In other words there will be a whole series of exact specifications of the states of activity of the 10,000 million individual nerve cells which are consistent with the presence of this word in the consciousness. Or to put it another way, there is no reason to suppose that when you think the same word twice, that on the two occasions the detailed pattern of firing of the individual nerve cells will be the same. Amongst the patterns of individual specifications of activities of nerve cells – and there must be about 2^{10} different patterns – some must correspond to each of the finite set of words in your vocabulary although many, perhaps, may correspond to no word at all. The mathematical difficulty here is that the set of possible patterns is so large that, from a macroscopic point of view, the patterns may, presumably, be regarded as continuously variable. This apparent continuity would be very roughly analogous to the apparent continuity of change which occurs on a cinema screen, even though the change from frame to frame is in fact discontinuous. The words, being finite, and quite limited in number, are not in any reasonable sense continuously variable, and so as you vary the pattern corresponding to some word there must come a point when an infinitesimal alteration in it suddenly alters it into a pattern corresponding to another word or, perhaps, to no word at all. It would seem as if the activity of a single nerve cell could make

the difference between whether I say "I love you" or "I hate you". And this does not seem easily resolvable with the considerable evidence for the robustness of the nervous system to even quite considerable damage.

Another feature of the sequence of words in the consciousness is that there would not seem to be any tendency for a passage to equilibrium. While we are awake, the words continually change and, if we accept our previous argument, this then poses us with a considerable problem of finding a theory in which the macroscopic parameters never have any equilibrium values.

These problems seemed to me, from a mathematical point of view, to be really fundamental and, conversely, it seemed that the solution to them would tell one something really fundamental about the way the brain worked. On the other hand, it may appear to you that these considerations are obscure and unconvincing. Certainly they are not rigorous and should be regarded, perhaps, as an attempt to explain an intuition. Therefore I would like now to reach what are essentially the same problems from two very different points of view.

Sir John Eccles (1965) in his Eddington memorial lecture last year at Cambridge concerned himself with the problem of the unity of conscious experience and that is, in my opinion, very closely related to the problem which worried me. In the course of his lecture he referred to Sherrington's version of this problem (Sherrington, 1946), and this I have found to give a very satisfactory alternative to my own.

Like Eccles after him, Sherrington was concerned with how the multitude of individual nerve cells could collaborate to produce a clear-cut choice of action for the animal as a whole. And with his extensive experimental knowledge of the nervous system, he was able to say: "Where it is a question of 'mind' the nervous system does not integrate itself by centralization upon one pontifical cell. Rather it elaborates a million-fold democracy whose unit is a cell". Once one accepts that the nervous system is a democracy, or even an oligarchy, one has the problem of how are the votes collected and how is the result of the vote communicated as a command to all the nerve cells involved. And Eccles accepts this problem saying: "The antithesis must remain that our brain is a democracy of ten thousand million nerve cells, yet it provides us with a unified experience". I have deliberately referred in detail to these views of a leading neurophysiologist of the past and one of the present.

Inevitably a mathematician with only a few years interest in a field, will not have the same grasp or feel for it as the best of those who have devoted their lives to it, and therefore it should be encouraging to him to see essentially the same problems from his standpoint as they do from theirs.

Thirdly, let us take the argument from psychology and I shall refer specifically here to Lashley's views, which have influenced me considerably. Lashley has constantly emphasised that, in both the relation between stimulus and response and in memory, a large number of cells are involved but that these cells are not necessarily the same in each repetition of the same situation. He said already in 1930, for example, with reference to the visual input (Lashley, 1930): "The same cells may not be twice called upon to perform the same function. They may be in a fixed anatomical relation to the retina, but the functional organization plays over them just as the pattern of letters plays over the bank of lamps in an electric sign". In the same paper Lashley even refers to this as "the fundamental problem of neural integration" and much later Burns in "The Mammalian Cerebral Cortex" puts this problem in a central position in his discussion of memory (Burns, 1958). Of course, Lashley's image of a "bank of lamps" should not be taken too literally and from our mathematical point of view we may interpret it as meaning that corresponding to a complete specification at the macroscopic level of a thought or memory or decision, there are many detailed specifications of the pattern of individual nerve cell activity consistent with it.

I have given indications from mathematics, physiology and psychology of a type of fundamental problem facing one in the construction of a theory of the brain. I was led to it, myself, through introspection, as a question relating specifically to the human brain. But Sherrington and Lashley had versions of it which were applicable to any animal and, for that reason, I think it may be better to consider primarily the question of how the aggregate of individual nerve cells makes clear cut decisions on courses of action. Because the decisions are mainly those which, in man at least, are called conscious, I have used this word in the title of my lecture.

Let us now have an aside on our friend the digital computer. It has a "brain" which makes decisions and has memories and so forth. Furthermore it has an internal construction that we know in detail and so it is worth while pausing to consider our problems in that case. In a digital computer, as normally operated, there is

approximately a 1:1 correspondence between the macroscopic and microscopic description – in a calculation every bit can count. None of the problems we have been discussing arises in any acute form. As far as decisions are concerned, a computer acts on the basis of an order such as “JUMP to a new position in the program if the number in the accumulator is zero, otherwise carry on as before”. We have here a situation very close to Sherrington’s single pontifical nerve cell – only the number in the accumulator decides what happens, in fact only one bit of that number need be used.

Now, I have talked a lot and this is a field in which men have talked endlessly. But that does little more for us than to set our brains in a receptive state; it does not give us any theory that has any precision. None of the problems that I have raised are at all clearly defined and you would be quite justified in arguing that I have given them the wrong emphasis in many ways. The only way one can see them more clearly is to construct a calculable model in which the problems occur in much the same form. A model, in other words, in which the problems can be seen clearly and the solutions are obvious. We now pass on to do this.

Suppose we have n nerve cells, each of which has only excitatory connections with some of the others and no inhibitory ones. Suppose also that the connections are extensive and made at random. Evidently at any moment anything from no cells up to all n cells may be firing. Let us start the mass of nerve cells with a fraction of them active. What happens? Using the McCulloch-Pitts nerve cell model and some non-rigorous mathematics, one may easily analyse the case when the cells have each the same number of links to other cells. The result is simple. If the total initial number which are active is below a certain threshold value, the activity dies away, and all cells become permanently inactive. If the initial number is above the threshold, then the activity increases till all cells are permanently firing as rapidly as possible. No matter how you start it, the mass passes to one of two terminal, stable, states and stays there. This is illustrated in Figure 1a where the results of a computer simulation of such a mass are shown. It is possible to construct counter-examples to this behaviour. Nevertheless, they are rather exceptional and the tendency of the mass to pass into a state of zero or complete activity is characteristic of arbitrary connections of cells which have only excitatory links between them.

As I have described it, once the mass of nerve cells became maximally active, it would stay so for ever. It would, as it were,

have an epileptic fit for all eternity. But we have ignored the effect of the habituation, or tiring, of nerve cells. After a period of activity a nerve cell is probably less responsive to stimulation than usual. If we accept that the habituation is powerful then, if the activity starts above the threshold, it will go first to a high value and then, as the cells tire, fall below the threshold, whereupon it will fade away completely. Two things are now possible : the activity fades at once, or there is a burst of activity and then it fades. A computer simulation of this situation is illustrated in Figures 1b and 1c.

Now we are in a position to construct a very simple theoretical model of an animal – an animal which can make just one decision. Let us equip our mass of cells, which we shall call the brain, with an input and an output. The input might be from a set of sensory cells, such as photoreceptors, which synapsed with the cells of the brain. The output might be to motoneurones, that is cells operating muscle fibres. This is shown schematically in Figure 2.

Let the animal now start with all its cells quiescent. Then suppose there is an input from the sensory cells to the brain. A certain fraction of the brain cells will become active and, if this exceeds the threshold of the brain, all cells become active, otherwise the activity dies away. If the former, then the brain cells excite the output motoneurones and hence the animal makes a response. Here we must suppose that the motoneurones have sufficiently high individual thresholds so that they are only fired when the brain reaches a paroxysmal level of activity. In other words they do not fire when the brain is in sub-threshold activity. This is easy to ensure. The response occurs so long as the brain is in its paroxysmal state. Soon, however, the cells of the brain habituate and the response ceases. When the brain cells recover, the animal is ready to respond again to any further super-threshold stimulus.

What, you may ask, is so special about this particular model of a theoretical “animal”? It is not, of course, that we have used evocative words like “brain”, “response” and “animal” in describing it – we could do that about any device having an input and an output, if we wished. It is this : that this model resolves in a simple and natural way all the problems that we have raised earlier and in a way that might occur in the brain of a real animal. I am not at the moment claiming that it does. What I am claiming is that, in this model, we can recognize and answer our previous problems. This is immensely valuable, in itself, because it removes at once a

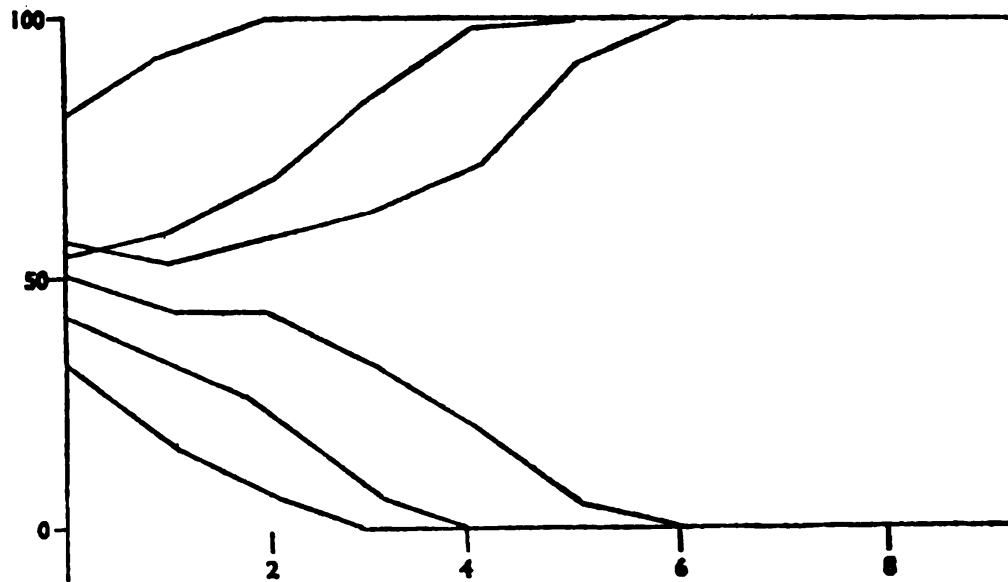


Figure 1a. Activity of various masses of 100 McCulloch-Pitts idealized neurones plotted as a function of time. Typical runs starting with various initial activities. θ = threshold of individual neurone; n = number of links to other neurones; $\theta = 3$, $n = 5$, no habituation.

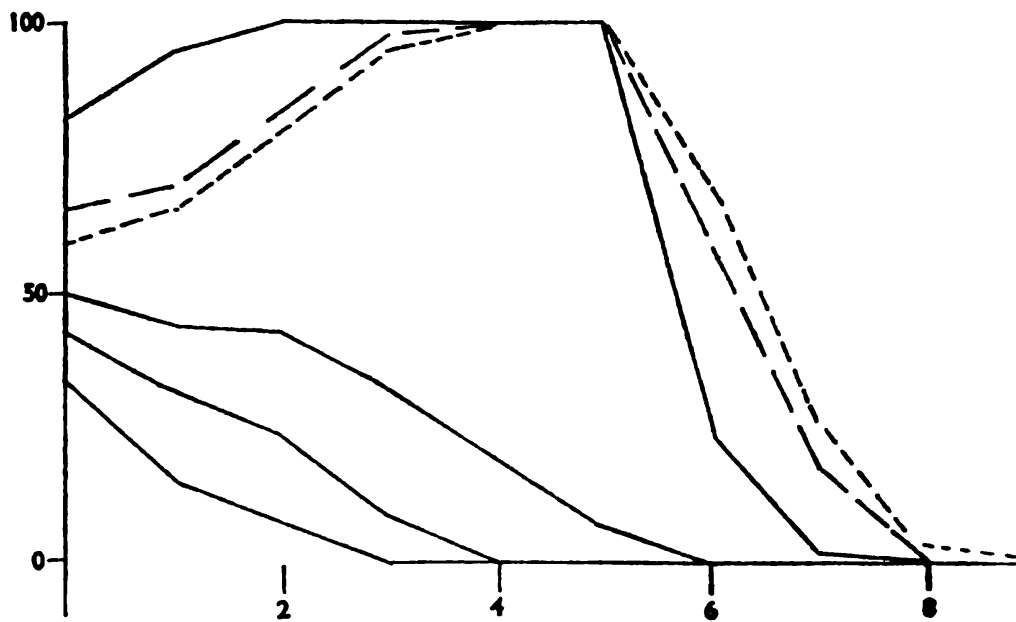


Figure 1b. As in Figure 1a, but with habituation.

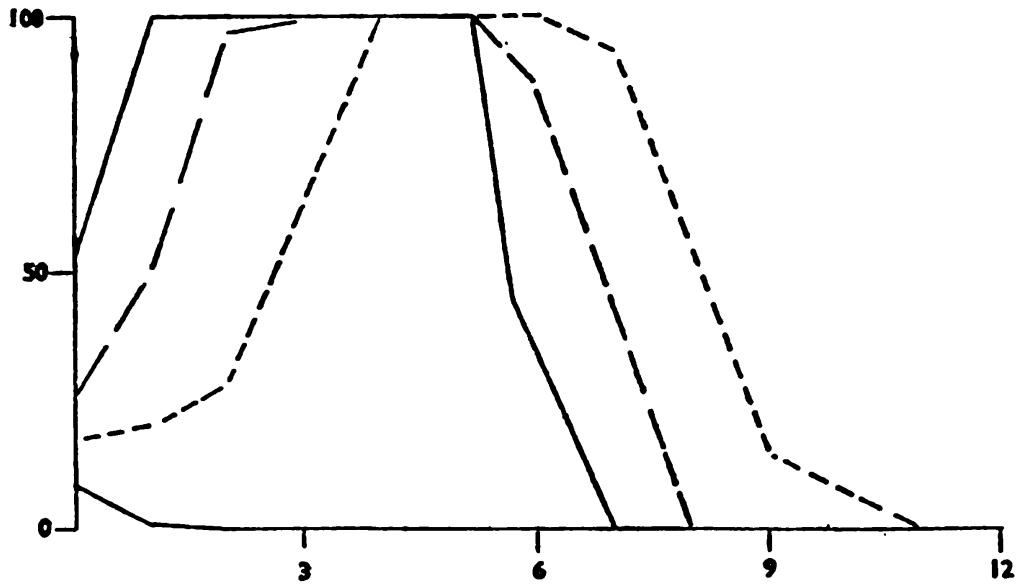


Figure 1c. As in Figure 1a, but $\theta = 4$, $n = 14$ and with habituation.

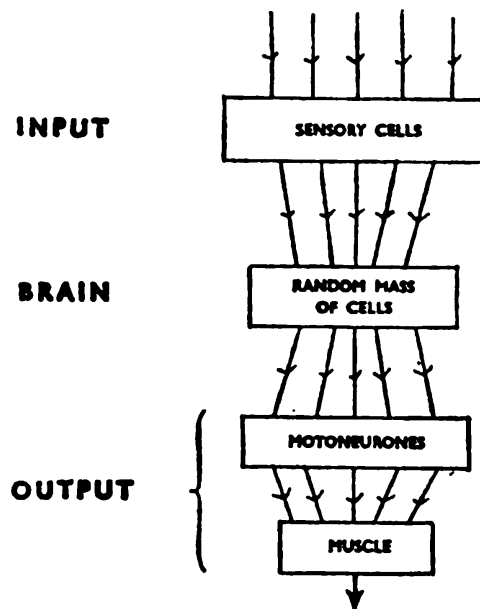


Figure 2. Schematic diagram of the simple theoretical animal.

great deal of the feeling of mystery which appears to surround the original problems. Let us now examine how this comes about.

First we look at the argument from statistical mechanics. We see that we have a simple macroscopic parameter for the brain – its average level of activity. Underlying this are the numerous detailed firing patterns consistent with any particular value for the macroscopic parameter. And these may be numerous indeed, for there is no limit to the number of cells which our brain may contain. The actual number of patterns is easily calculated. If we know that the brain has n cells and x of these are active, then the number of different possible patterns of individual activity is given by the binomial coefficient $\binom{n}{x}$. This can easily be very large; even in a brain of 50 cells with 30 active, it becomes 47 million million. For a brain with millions of cells, it is quite colossal. So we have a simple macroscopic description of the brain which has underlying it a microscopic description which may be extremely complex. There is, then, an analogy with the conventional statistical mechanical situation, although it is really fairly superficial.

Next we note that in this simple brain it is certainly true that the activity of a single nerve cell can change the output from a response to no-response or vice-versa, but only when the input sets the brain extremely close to threshold. Thus our model could be changed from saying “I love you” to saying nothing at all, if one nerve cell failed, but only if it was pretty uncertain about the matter in the first place!

Then we had an argument based on the central limit theorem. Two defects, at least, in that argument now appear. It is clear that the activities of individual nerve cells are very strongly correlated – they are nowhere near to being independent random variables, which is the assumption on which the majority of the derivations of the central limit theorem are based. Another defect, which I think is a very instructive one, is that it is not at all obvious that the nerve cells in our model should be regarded as random variables of any sort. It is not clear that it is meaningful to talk of the probability of firing for any of the cells at all. The origin of the difficulty of using probabilistic arguments about a system of this kind lies in the input. The various possible inputs, or stimuli, may each turn up with certain probabilities. But they need not do so. For this reason, there may sometimes be a fundamental as well as a merely practical difficulty in asking precise questions about animals of an information-theoretic character.

Now we turn to the physiological side. Our simple brain can make one single clear-cut decision – to respond or not – but the decision is a co-operative one made by the whole set of nerve cells in the brain. No particular cell has any over-riding say in the decision; in fact all cells are approximately equal. There is thus a true democracy and we have found, in one special case, a solution to Sherrington's problem. It is at the same time a solution to Eccles's problem of the unity of consciousness. The average activity, which is the macroscopic parameter, is a property of all the cells. It corresponds to the much more complex consciousness of a more complex nervous system. It belongs to all the nerve cells and yet it is a single thing. We see how what seems impossible, when discussed in general terms, becomes easy when we look in detail at a particular model.

Another curious situation appears in the so-called split-brain experiments of Sperry and his collaborators (Sperry, 1961). As you doubtless know, the brain of a man or other mammal is approximately symmetrical. The right half of your face is approximately the mirror image of the left and the same is true of the brain which lies behind. The connections between the two halves are largely nerve fibres – that is, they consist mainly of nerve processes not cell bodies. If they were to be severed, you would expect the brain to be so badly damaged that the two halves would be completely useless and perform no normal activities.

Not so at all. The majority of the connecting fibres form an immense bundle of some two hundred million (see Glees, 1961) crossing near the top of the brain and called the corpus callosum. Men have been born without a corpus callosum and suffered no very apparent defect during life. More than this, Sperry's experiments on monkeys and, therapeutically, on men have shown that the two halves of the brain can be entirely separated to a great depth with only minimal disturbance of normal function. In the monkey, the result is that the animal now has two brains, each of half the size but of comparable capability to the one it had before. The two halves are quite independent and, in suitable experiments, can be shown to learn simultaneously quite different things. If we assign a consciousness or a spirit to a monkey, I think we must say that whereas it had one of these before, after the experiment it has two.

There is a difference between man and monkey which is connected with a matter called cerebral dominance. The two halves

of a man's brain are not equal in status and, in most people, the left half is the dominant one. In fact the important function of speech is normally mainly controlled by the left half of the brain. The left half might be called the clever half and the right half the stupid half. This is unlike the situation in the monkey where there is little difference between the two halves. As a consequence, when you split a man's brain the left half is still about as able as the whole brain was before whilst the right half is moronic. It is sometimes thought that this means that the consciousness has retreated from the whole brain to the left half, because the left half behaves much as the whole brain did before. This, I think, is not the right way to look at it. Rather we should say that where there was one brain and one consciousness before, the surgeon's knife has turned it into two independent brains and two independent consciousnesses. Both of these new brains would, presumably, remember having been the single brain which was there before. One would remember this with satisfaction, at least providing it was cured from the mental disorder the whole brain had had. The other would regret its present stupidity and wish it still had abilities now irrevocably lost. Incidentally, it is possible to communicate with the stupid half and, furthermore, in the normal behaviour of the whole man, signs are sometimes visible of its attempts to assert itself.

Well, of course, all this seems very remarkable, and any brain theory has to account for it. I wish first to consider a comparable matter for our simple brain and then to describe in a rather general way how we might explain it even in monkey or man. If we take our simple brain having n cells in it and split it into two having each $\frac{1}{2}n$ cells, the two halves will clearly be simple brains of the same general type as their "parent". Each half could make one decision, independently of the other half. The whole system would now have two natural, independent macroscopic parameters, namely the average activity of each half. The consciousness of the whole system would change from being described by one parameter to being described by two independent ones.

I believe that this is a true, though very simple, analogy with the situation holding in Sperry's experiments. Another, more picturesque, way of describing this view is as follows. Liken the brain to a pair of pendulums which are firmly tied together with a piece of string. The two swing as one and it would be natural to call the tied pair a single more complex pendulum. Cut the string and there are two separate pendulums, each swinging independently.

Again one has become two. To express this in more mathematical terms, the simplest version of my view about the split-brain situation is to say that in the dynamics of the brain the two halves have very similar equations of motion, but there is a strong coupling between them which ensures that the macroscopic parameters of the two sides are normally constrained to be the same. The coupling would be maintained through the nerve fibre tracts of the corpus callosum and other structures which cross from one side to the other. When these structures are cut, the number of macroscopic parameters is doubled, each side having a separate set.

Now let us turn to Lashley and the question of whether the same nerve cells need be active during successive responses. Clearly they need not, because our simple brain will still behave in the same macroscopic manner even if many of its individual cells are inactive due to habituation arising from their past activity, providing merely that there are enough cells active to exceed the necessary thresholds. Then on successive occasions different cells may be habituated and different cells be active. In fact the active cells might be totally different on two following occasions, even if at the macroscopic level the behaviour were identical. In a brain of this kind, the functional organisation indeed plays over the individual nerve cells.

Well, we have seen that the consideration of a definite model can throw much light upon a number of matters which are, otherwise, rather obscure. We have no time to pursue it any further in order to discuss how it might be generalized to form a possible model for a mammalian brain or how it could be given a memory. I have submitted such a discussion for publication elsewhere (Griffith, 1966c), that discussion being consistent with my hypothesis about the biochemical basis of memory published recently in *Nature* (Griffith, 1966a), but now I have only time to make a few remarks about experimental evidence, before I conclude.

First, I do not know whether this very simple kind of brain exists anywhere in nature. It is true that there are animals which make exceedingly few decisions. The polychaete worm *Myxicola Infundibulum*, which lives in the sand at the low-tide mark, sticks a crown of tentacles out in order to respire and feed. If disturbed, it contracts and disappears completely into the sand, returning passively after a certain relaxation period. It seems that this may be the only decision of which it is capable, to disappear or not, and this decision is completely an all-or-none affair (Roberts, 1962). Unfortunately, however, in *Myxicola* there really is conver-

gence onto a single pontifical nerve cell; a nerve cell which, appropriate to its dictatorial position, is extremely large (up to 1.7 mm across the axon). Of course, this by no means disproves the presence in series with it of the kind of brain we have just discussed, but it does show that it is not necessary in this case.

The example of *Myxicola* can be matched in more complicated invertebrates. In crustacea, for example, many functions are performed by one or two nerve cells, which would be performed in vertebrates by very many cells acting in parallel. The lobster and crayfish tails each contain four giant axons and a single pulse in any one of these will initiate the violet defensive snap of the whole tail (Wiersma, 1961).

However, there is no reason for supposing that the highest level of decision-making in mammals or other vertebrates uses such a mechanism. As I indicated before, I am proposing elsewhere that this is done by a generalization of the simple brain we have discussed earlier. A piece of experimental evidence in favour of this was pointed out to me by Dr. G. S. Brindley, after I had already elaborated such a generalization. In 1960, Burns and Salmoiraghi showed that the action of breathing in is probably controlled by just such a neural organisation in the mid-brain reticular formation. Breathing out is controlled by another similar one.

I hope any professional philosophers present will not consider me presumptuous if I finish with a very brief word about what I consider to be the correct philosophy of a scientific approach to the study of the brain. It is often said that one has a direct knowledge of the existence of one's own mind, but that the conviction we mostly have of the existence of other people's minds is based on plausible but logically unconvincing arguments. It is against common sense to disbelieve in other minds, but it is against sense to believe in them.

In our scientific studies of the brain, will we ever have trouble with this sort of problem? I think there is no reason for supposing that we will. The scientist's basic hypothesis is the existence of an objective world which he attempts to measure and theorize about. This world is made up of bricks called protons, electrons and so on. Out of these bricks are made atoms, molecules, cells and brains. Thus his picture of the brain is inevitably a mechanistic one and may well become, as I believe it can, a complete one without having to introduce any independent undefined entity as "mind".

The consequence of this philosophical position is that statements

like "other men have minds" or "Men can think, and so can machines" contain words like "mind" and "think" which I do not understand in such contexts because they do not have any clear scientific meanings. If definitions were given they would have to be in terms of scientific concepts and in such a way that I would then understand the words as well, or as little, as I do other scientific terms. Furthermore, the truth or falsity of such statements would then become a mere matter of calculation and would depend, moreover, upon the precise definitions adopted.

Of course, such a position does not dispose of the problems connected with mind. It merely applies a transformation to the scene, whereby it removes the fundamental philosophical puzzle concerning other minds and replaces it with a puzzle concerning introspection. We are left, in other words, with a problem which is superficially similar to the classical paradoxes of self-reference.

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More about Mad Quakers

Mary Glover

My first article described how in 1796 William Tuke, a tea-merchant of York, founded an asylum to be run by Quakers for Quakers; and how within a very short time the physician Dr. Fowler, and the superintendent George Jepson broke away from the orthodox treatments of the time – dehydration, designed to drain the body of noxious fluids, and government by fear by which patients were supposed to be controlled. These changes produced a relaxation of tensions; and Jepson built up a new technique of treatment for the mentally ill, based on understanding and sympathy.

Description of the Retreat.

In 1811 Henry Tuke, son of the founder of the Retreat, suggested to his son Samuel that he should write a history of the asylum, which had now been running successfully for 15 years.

Henry was himself a writer, who had in the last decade published four books about Quakerism. His Principles of Christianity was much loved; there is a copy of it at the Retreat, a small leather-bound volume, tooled in gold, inscribed by Henry to George Jepson. But he could hardly have undertaken the history of the Retreat himself; he must have been a very busy man. The management of the tea business had by now devolved largely upon him; it had been extended to include cocoa and coffee and the manufacture of chocolate, and new premises had been acquired. Moreover Henry from time to time undertook journeys to visit Quakers in distant places, his interest in religion was very great.

Sam was 27; he took his father's request very seriously, partly because it was his father who made it; he had been interested in insanity since 1804. He forthwith gave up the study of Hebrew, which he had been learning in order to be able to read "at least the poetical parts of the Old Testament in the original" (so he says in his *Memoirs*). He was a great reader and he now set himself to the study of insanity; he read widely and visited asylums. Almost the first thing he did was to invite George Jepson to dine; "we talked about insanity".

These studies were effective. When the book, *Description of the*

Retreat at York, appeared it was widely assumed to be by a medical man. (This must have been gratifying; Sam had wished to be a doctor, but had to go into the tea business as an apprentice when he was 13; he was needed there as at that time his grandfather was much preoccupied at the Retreat.) The book appeared in 1813, the year before his father's death. One might surmise that Henry never rendered a more valuable service to humanity than when he put his son on to writing this book.

Description of the Retreat includes an account of its founding, followed by a chapter on the house and grounds. The house and grounds were an expression of great originality in the thinking of William Tuke. Sam thought then and throughout his life that the design of asylums has a profound effect on the management of patients and the kind of life they lead. He became himself an authority on this subject, wrote on it, and was consulted about it. He did not think the design of the Retreat was faultless; he regretted that the galleries had small rooms on both sides; these provided a number of patients with rooms of their own, but this made the galleries rather dark. Sam welcomed the planning of the asylum at Glasgow, which had windows all along one side of the galleries. He remarks that many asylums have faults of design arising from "excessive attention to safety". "People in general have the most erroneous notions of the constantly outrageous behaviour or malicious dispositions of deranged persons". Then comes a chapter on Dr. Fowler's experiments with the orthodox treatments and his decision that they did no good. There follows a long section on the methods of George Jepson and the theory that arose from them. The book closes with a useful chapter on statistics; and notes on the varieties of mental illness which are, from the medical point of view, quite valueless.

The heart of the book is the section on the work of Jepson. Sam says that "many benevolent men in many places have too long been dissatisfied with the system of management generally pursued, but benevolent theory was powerless when opposed by practical experience", though, as he says, the man of long experience may be narrow and mistaken; but this book is reporting what has actually been experienced in the course of experiment. Jepson, he says, had "by his talents and humanity carried into effect the benevolent wishes of the original promoters of this Establishment beyond their most sanguine expectations . . . had I not been assured of his cordial assistance the work would not have been attempted

. . . It affords me some satisfaction to reflect that some at least of his knowledge is now communicated". The acknowledgments to Jepson continue throughout the book, "The superintendent says . . .".

He politely explains that George himself was too busy to undertake to write up his own work, and this was doubtless true. But it is doubtful whether George could have written a book even if he had had nothing else to do. Such scraps of his autograph as remain are in a small wavering hand, the hand of a man who does not often or with pleasure put pen to paper, quite unlike Sam's racing business copper-plate (though George wrote a lot of letters to relatives about patients).

The theory to which Jepson and Sam Tuke came as a result of the experience at the Retreat was that in insanity the mind is impaired but not destroyed; that treatment should be applied directly to the mind, by appeal to the reason and the affections of patients; that steady occupation is very beneficial; and that by these methods the patients may be nerved to make exceptional efforts at self-control and so contribute to their own cure. (Such efforts must of course have considerably alleviated the task of the attendants, and it is probable that the tranquil management of the Retreat owed quite a lot to patients themselves.)

Results

At the end of *The Description* Samuel Tuke gives some statistics of the results achieved at the Retreat in the years between 1796 and 1811. During these 15 years they had accepted 149 patients, 60 recently ill and 89 who had been ill a long time. Of the 60 recent cases 40 recovered and 8 improved considerably, a total of 4/5ths; of the 89 who had been ill for some time 18 recovered and 23 improved, a total of just under half.

It so happens that these figures can be compared with records kept unofficially at Bethlem.* It was not the custom at this hospital to keep records, but John Gozna, who was apothecary there for many years till 1795, had made notes for his own interest on patients admitted between 1772 and 1787. Some patients at Bethlem received treatment and some did not. From Gozna's records a certain Dr. Black deduced that "Two thirds of all patients in the first

* Bethlem was founded as a priory in 1247; later it became a hospital; by 1403 it was an asylum for the insane; Bedlam is a corruption of its name.

attack will recover within twelve months . . . if left to the unassisted efforts of nature.”† Macalpine and Hunter (*George III and the Mad Business*, p. 299), from whom this information is taken, confirm that this is borne out by general experience. “Of 100 psychiatric patients taken at random one third will recover completely, one third will recover but not to their previous level, and one third will remain impaired or get worse”. Of the total of 149 patients at the Retreat 89 recovered or improved; this is less than two thirds but they had a considerable preponderance of people who had been ill for a long time.

The Retreat figures compare favourably with the Bethlem record. The Retreat patients correspond to the untreated patients at Bethlem, because Dr. Fowler so quickly discontinued all medical treatment. Their figure of 48 out of 60 cases recovered or improved is better than the two thirds of patients in the first attack at Bethlem.

Haslam, the apothecary who succeeded John Gozna at Bethlem, produced more figures for patients admitted between 1784 and 1794, the decade that preceded his arrival. 1664 patients had been admitted of whom 574 had been discharged cured and 1090 uncured. This is a smaller proportion of cured than Black’s figure for those not treated, suggesting that the horrible treatments of Bethlem prejudiced patients’ chance of recovery, and this is likely enough; but it does not follow from the figures, because it may be that only patients who seemed to be iller were treated, and those who were only mildly demented were left “to the unassisted efforts of nature”. Haslam does not distinguish recent from long-standing cases.

However the Quakers at the Retreat were not interested only in the statistics of recovery; they knew that many patients would not recover, especially those who had been ill a long time, and they were concerned that these should have their illness in comfort. Comfort is impossible for those who are suffering from certain conditions, like severe depressive illnesses or paranoia or bad schizophrenia. But the staff were tireless in their kind attention to the hopelessly ill. Sam Tuke comments on these that “many of those whose wits have almost gone are very easily amused, and many hopeless patients become affectionately attached to those who look after them”. One patient came to them unable to use his legs, be-

† See Dr. William Black, *A comparative view of the mortality of the human species of all ages, and of the diseases and casualties by which they are destroyed or annoyed*. 1788.

cause he had for so many years had them in irons for fear of his becoming violent. They removed the leg-locks and taught him to walk; and when visitors came to see him, and asked, "What is this place called"? he answered "Eden, Eden, Eden!" Some patients wanted to stay on at the Retreat for a time after they were recovered because they were happy there.

One of the most striking and beneficent, and also the most obvious, results of the moral treatment at the Retreat was the abatement of violence and the abatement of fear; the two changes went hand in hand, but the initiating movement came from Jepson, when he decided to abandon the regime of control based on fear and severity. The result of this was that patients became quieter. The fearlessness of the staff, "the Quaker contempt of danger", struck Sydney Smith as amazing. Jepson came to believe that most of the violence in asylums that frightened keepers and thrilled visitors was the result of provocation, the chains, abuse, beatings and so on that patients were subjected to by the keepers. The thing that fascinated visitors to the Retreat was the quiet and the calm. This was the foundation on which it was possible to build much more, arrange for steady occupation, engage patients in talk, provide recreation, take them to Meeting, have tea-parties lasting most of the evening and so on.

What this amounted to in the experience of patients, the calm and confident intercourse, the relaxation of tension, can hardly be imagined.

The Succession

The minutes of the Committee of the Retreat record that on October 23 1820 "a serious accident having deprived the Institution of the services of the superintendent, the Institution to be visited daily in rotation by a panel of ten Friends". Perhaps Jepson had a stroke which occasioned a bad fall. The Minute for March 19, 1821 records "Geo. Jepson having recovered from his accident and able to walk about the house, the extraordinary visitation shall cease". And then very oddly there is a precisely similar minute for May 16. In 1823 Jepson resigned. He was 80 and there had been some signs that suggest failing powers; he had of recent years been asked to do fewer jobs and Sam Tuke had taken on more. His wife resigned with him and they went to Leeds. The Retreat gave him a pension of £50 a year for his lifetime; Katharine outlived him

for 16 years and she had then no pension, though she had served the Retreat with distinction for longer than her husband.

In December 1822 William Tuke died aged 90. He had been blind for some years.

Thus the Committee had had ample warning that the two men who had between them created the Retreat must soon be superseded, and it would have been wise for them to groom somebody for the superintendency. This they had not done.

I think they were in a difficulty. William Tuke had originally felt that he needed somebody of his own class to be superintendent, and Timothy Maud was the right man. The superintendent had to exercise authority, not only over patients but over staff; all writers on asylums emphasise the difficulty of getting staff to be diligent enough and pacific enough to look after patients properly; the superintendent had to receive visitors with good manners and do the Retreat credit, this had been done usually by Tuke, and the Retreat had had many distinguished visitors, whose approval meant a great deal; and he also had to have organising ability. Tuke had been very doubtful whether Jepson could measure up to the job, but when he came he was very good and Tuke gave him a lot of help. Now they could not find anybody with the qualifications they were looking for who wanted the job.

A few months before Jepson announced his resignation formally to the Committee, a man called J. Binns, having served for some months on trial, was appointed as attendant. When the Retreat began to make it known that they wanted a superintendent, Binns put in for the job. Shortly after, on May 1, he was given notice to go as soon as the Retreat had found someone to replace him. He left on May 10. One assumes he had been told that he would not be promoted and he left because he was not prepared to continue in a subordinate position. (As he was by now a trained and experienced attendant, his going must have weakened the staff.)

That left the Retreat with a short list of three, only one of whom appeared at all possible. This was Thomas Allis.

Allis had been at school with Sam Tuke at Ackworth. Sam was now on the governing body of the school, which needed a new headmaster. Sam approached Allis about this appointment. Allis had had a school of his own, but was now in business, selling agricultural machinery. He was interested in the school and offered some good advice about the boys' leisure, he thought they needed books and a room where they could read. But he did not want

the headmastership. He did apply for the post of superintendent of the Retreat.

By his own account he had no qualifications for this work. He said his friends had assured him he could do it. He said of himself that he was "a man about 35 years of age, having no medical knowledge" (the Retreat had hoped for a medical man) "whose only approximation to such knowledge is a superficial knowledge of chemistry as a science; professing as he hopes just common rate abilities; with general knowledge and powers of perception and attention and perseverance about on a par with the generality of persons occupying the middle rank in our society, in which rank most of his friends are to be found".

His language strikes one as rather pompous and very dull; but I suppose it was acute of him, as he was a very commonplace person, to take the initiative in saying so himself.

Sam was rather horrified at the idea of bringing a young family to live in an asylum. George and Katharine had always lived *in* the Retreat and shared their meals with the staff and some patients; Allis could not quite see the difficulty. He wrote in October 1822 "I am aware of the tendency to imitation in children, but I presume thou doest not mean that this tendency would be likely to become contagion and produce insanity in the child?" He thinks "he could check such imitation as well as other follies of so many boasting the possession of reason". He had no apprehensions that the screaming or behaviour of the insane could distress children.

In January 1823 he found his business needed a fresh outlay, for which he did not wish to borrow, and now he *wanted* the post at the Retreat. He wrote again to say that his wife's sister lived with them and therefore a cottage near the Retreat would meet their needs and he would like to know "at least the minimum salary in mind". The only reason he could think of for supposing that he was equal to the work was that several of his friends had said they were confident he would be. "It will not I presume be expected that I should have felt any natural predilection for the work; such a predilection I should conceive impossible; tho' I think it very possible for a person entering as he ought on its duties to be so interested in the welfare of the Institution and of the unhappy objects of his care as to become really fond of the employment".

One would have thought he had written himself out. But he was appointed and had a long reign. In 1840 he left the Retreat

and set up his own private asylum at Osbaldwick, taking with him some of the best attendants at the Retreat.

Josiah Rowntree, who had known him well, said that he was "unpolished in manners and appearance, a hearty, vigorous man, a naturalist . . . fond of boys".

All went well. His previous experience suggests that he might have fancied himself as a person who knew how to keep order among the unruly; he had presumably controlled his boys with the cane, and his coming might have meant that the Retreat would be in danger of a return to the rule of fear. (But it is possible that he had not controlled his boys and that was why he gave up school-mastering.) He was benevolent, and I find I have suspicion that there was in him a streak of idleness; this is a very great advantage to an institution that has a new superintendent who does not know the first thing about his job. He must have had the sense to let the Institution run itself at first. He was appreciated; the Retreat people respected the modest distinction he later attained as a naturalist, and one must remember that at this time people *liked* pomposity in men.

He had a number of people to help him. Sam Tuke in his *Mem-oirs* says that Jepson "gave him (Allis) advice and instruction", one does not know for how long. Sam, who was his friend, must have helped him a lot. Sam had succeeded his father as treasurer in 1822; later he speaks of himself as one who had for a time "almost *lived* at an asylum" (his italics). He had a house about five minutes walk from the Retreat; (a nice old house it must have been, with space and dignity, but now a good deal mauled about to make a chemist's shop and home combined). It may have been during the early years of Allis that he gave so much time to the Retreat. He remarks that in order to manage lunatics well, you have to overcome "some of the deepest instincts of our nature" (partly because of their almost intolerable insolence). This suggests that Sam had not only helped in the administration of the Retreat but had himself coped with patients and found them maddening.

Another person who must have been of great importance at this time was Hannah Ponsonby. She had come to the Retreat in 1797, to look after her mother who was a patient; later she was taken on to the staff, and worked for years under Katharine Jepson. When Katharine retired Hannah succeeded her as matron. The stories about her that have survived suggest that like Katharine

she had the gift of making life pleasant; the ladies who came from York on Mondays to help her mend sheets found this a very jolly occasion; and she certainly had easy authority.

One must not forget that the patients themselves must have made quite a considerable contribution to the tranquillity of the regime. There were many long-term patients, who constituted with the staff the core of "the Family"; they helped with work and with other patients.

The Committee must have found Allis adequate. Within a few years of his coming they had built him a house; and also added rooms to the Retreat for the seclusion of men and women who were violent. There were more of these than formerly. It is not surprising if Allis had not the genius George Jepson had in sensing rising excitement before a crisis arrived and talking the patient out of it; but fits of violence do not as a rule last long, and the evidence is that not many people were confined for a long time.

So the tradition which Jepson and Tuke had invented and developed did not die with them, but was bequeathed undiminished to their successors. An American physician from New York, who visited England to study asylums in 1863, writes: "The York Retreat . . . hallowed in the memory of everyone who appreciates the spirit of benevolence which originated it and has ever since pervaded its halls, still pursues its mission . . . it was sufficiently apparent that the genius and earnestness of Tuke still abide among his successors." (D. H. Tuke, *History of the Insane in the British Isles*, p. 134, quoting from the *American Journal of Insanity*, Oct. 1863.)

The Impact of the Retreat

Astonishingly the publication of the *Description* excited furious anger in a certain Dr. Best. He was the physician in charge of the York Asylum. (This was the asylum where Hannah Mills had died in 1792.) Best wrote to *The York Herald* (23 ix 13): "When an attempt is made to injure the reputation and interests of any public body . . . it is of little moment to the assailed party whether the measure be accomplished by open libel or masked insinuation . . . In an account of the Retreat for lunatics near York published a short time ago, some highly indecorous and injurious insinuations were thrown out against other establishments for the same purpose, the intended application of which none could miss . . ." he went on and on and signed himself Evigilator. Sam

Tuke replied to say that there had been no intention of insinuating anything against anybody. The press took up the matter and altercation continued; Dr. Best wrote in the same vein several times.

He was unlucky. This outburst coincided with complaints made to a Yorkshire magistrate, Mr. Godfrey Higgins, that a man whom he had sent to York Asylum had been badly treated. Best held an internal enquiry and produced evidence from his staff that there had been no unkindness, and he and the Archbishop of York, who was Chairman of the governing body, and the rest of them hoped the matter was ended. But no. By this time suspicions were widely aroused and Higgins and 19 other York citizens, including Sam Tuke, bought themselves places on the governing body, at the price of a subscription to the Asylum of £20 each; they turned up in force at the next meeting to demand an independent enquiry. This brought shocking abuses to light, in spite of the fact that a great part of the Asylum and all its papers were burnt one night in a fire, when Best was away attending to a private patient. Four patients lost their lives; in the upshot all the staff were sacked and Best resigned (to found a mental home of his own). A fresh staff was engaged, the two Jepsens went over to the Asylum for a few days to help them, and William Tuke was asked to compose a set of rules for the guidance of attendants. The asylum then continued on an even keel.

These events coincided with the rise of public concern about a man called Norris who had been badly treated at Bethlem. He was a foul-mouthed dangerous lunatic, who had been for many years chained by his neck and limbs to a wall. Haslam, the apothecary in charge, had allowed him books and the company of a cat. But this did not help Haslam when the case of Norris and other abuses were the subject of a public enquiry; he was sacked without a pension (and set up a successful private asylum of his own). The two enquiries at York and Bethlem, both leading to shocking disclosures, helped certain members of the House of Commons to demand successfully the appointment of a Select Committee to enquire into Madhouses. This Committee included some powerful personalities including Robert Peel. It reported in 1815 on county asylums and in 1816 on private madhouses. Again the reports were horrible. Some places were not very bad, some of those keeping private madhouses for gain, like Thomas Bakewell, were humane and sensible. But the overall picture *was* very bad. The people appointed to carry out visitations under the 1774 Act, had done

so, but had been unable to do much good, because the law which empowered them to grant licences to madhouse-keepers did not permit them to *withdraw* licences; the law had no teeth.

These disclosures should have led at once to fresh legislation and the House of Commons repeatedly during the next decade attempted to carry a bill, but was always frustrated by the House of Lords; the debates suggest that this body was deplorably lacking in compassion or decent concern. However in 1828 a new bill was passed. This remedied a number of defects in existing regulations; its two most important features were that it gave the Metropolitan Commissioners in Lunacy power to withdraw licences from institutions that they found badly run; and that Lord Shaftesbury became a member and then chairman of the Commission, and devoted the rest of his life largely to the insane. In 1852 he made a speech in the House of Commons reporting great changes for the better and the disappearance of the worst old abuses. He showed himself aware of the work of the Retreat though he did not go there.

Thus the publication of the *Description* helped to spark off very important reforms.

In 1821 John Conolly, a medical student at Edinburgh, visited the Retreat. Tuke and Jepson were still there and Conolly was deeply impressed with what he saw. He was working on a thesis for the MD on the subject of insanity; he determined to devote his life to the insane. After varied experience he joined the staff of the asylum at Lincoln, and here he found that patients were being treated without the use of force. This experiment was on the whole successful, though there were some casualties. In 1839 he became superintendent of the largest asylum in the kingdom, at Hanwell in Middlesex. He determined to follow the methods of the Retreat. It would seem that the Retreat was more successful than Lincoln. D. H. Tuke gives his opinion that the regime of government without force would not have gained the support of public opinion on the basis of Lincoln alone. And it must be remembered that at this time the work of Pinel in France was widely known. Pinel at the Bicetre was conducting the same experiment as the Quakers at York, but they did not know of each other's work, because of the war with France. Pinel learnt of the Retreat from a Swiss, Dr. de la Rive, in 1798; but the Quakers did not learn about Pinel till they acquired a translation of his book, after the Peace of Amiens in 1806.

Conolly wrote several books about the treatment of insanity

and they were widely read. He acknowledged very fully and enthusiastically his debt to the Retreat, but differed from the Quakers on one point. At the Retreat the use of force, in the form of straps, was being gradually reduced. Conolly did not hold with this; his view was that if the attendants were allowed to use force at all, they would have recourse to it too readily, and too often; that any use of force excited the patients generally to alarm and tumult; and that if the use of force was prohibited altogether attendants would use their ingenuity to find other means of control; he did not think it very difficult to get attendants who were equal to this. At the Retreat Jepson believed that it would never be possible to find enough men and women so gifted that restraint could be abolished altogether, but the rule was that if restraint was needed, it must be applied by the Superintendent and assistants were not to have recourse to it themselves. Jepson could persuade a patient to accept straps or seclusion without noise or fighting, or upsetting anybody else; or if a man had occasionally to be overpowered, there would be enough helpers on the job to discourage him from resisting. It was one of the advantages of a small asylum of 60 to 80 patients that the superintendent could be called upon to cope personally in this way. D. H. Tuke (*History of the Insane in the British Isles*, p. 220) says that the Commissioners in Lunacy in their Second Report (1847 p. 224) record that "The adoption of a more gentle mode of management . . . was the result of public opinion and of the example set by the managers of the Retreat near York and (of) the publication of Mr. Tuke's account of the Retreat . . . In the best-conducted asylums restraint is now seldom (and in a few establishments never) resorted to."

Conolly was disappointed that once the practice of the Retreat had become widely known, it did not win universal adoption. But it is not difficult to say why this was so. At a time when there were no very effective drugs for sedation, the non-restraint system made too heavy demands on the numbers and giftedness of attendants.

The ideals of the Retreat were lost sight of, very generally, around the turn of the century. Mental nurses were pressing for changes in their training. This appears from an article by Dr. Walk in the *Journal of Mental Science* 1960. He explains that the tradition set up by the Nightingale School of Nursing at St. Thomas's in 1858 had been extraordinarily successful in raising the prestige of hospital nurses. Mental nurses wished to share this prestige and therefore to have the same training as hospital nurses. These nurses

were aspiring to be on a par with medical students, and therefore their training was being modified in order to be more scientific. Mental nurses were therefore taught, like other nurses, anatomy, physiology and surgery and other subjects, and these crowded out the long experience with patients which could have communicated to them something of what is needed, in understanding and sympathy with the mentally ill, and the skills of this type of care. In spite of the concentration on the mind of the individual, which characterised the work of Freud and Jung and their schools, this emphasis on physical treatment continued. In the 1930s new methods were introduced, which seemed for a time to be much more promising than anything yet tried, especially insulin coma, electrical shock and the surgical operation of leucotomy. Since the war new types of drug have been discovered, which appear to be in turn superseding the methods of the 1930s.

These physical treatments have diverted attention from a consideration of the experience of insanity, which the patient has to endure. It is understandable that you may not see the point of listening at length to the patient's tale of woe about feelings and fears and despairs, if you know you are going to be able to dissipate them with a drug. The patient believes that these interior experiences throw light on his condition which cannot be understood without his evidence about them; the doctor is convinced that the drug will restore normality, and the experiences will pass away like a dream, and have no further significance.

But it is being said that we are now catching up with the ideas of the Retreat.

Meanwhile the Retreat has preserved its own tradition. It has always been in the forefront of new work and experiment, but has not lost the old ideal of "the Family", of caring for individuals. Its present Director and some of the staff are Quakers and a Quaker Meeting is held there during the week, attended, though not in large numbers, by staff and patients. Some patients go to York Meeting on Sunday. Ex-patients still speak with warmth of the sense of loving-kindness which is the key-note of life at the Retreat.

Prototypic Organisms VIII: The Oat Seedling

Rupert Sheldrake

As members of the animal kingdom we can have or imagine we have some understanding of the behaviour of other animals at an intuitive level. But plants are totally unfamiliar. They develop and grow inscrutably. They belong to another living kingdom and obey alien laws. Perhaps partly for this reason the experimental study of plants seems to attract little general interest and is by no means a glamorous science. But the more one looks at plants and wonders how they work, the more interesting they become and the more striking is their strangeness.

Plants can in general only move by growing and, except when they are dormant, they are growing all the time. Their roots grow down into the soil, their shoots up into the air where they bear fruits and flowers and extend the large surface area of their leaves to the light which powers their photosynthesis. These obvious, basic features of plant development depend on the capacity of the growing plant tissues to detect and respond to two major environmental influences : gravity and light. Much of our knowledge and understanding of these processes comes from the study of oat seedlings, whose classical role in plant physiology began with the investigations of Charles Darwin.

The shoot of the developing oat seedling, like that of other grasses, is enclosed in a cylindrical, sheath-like structure called the coleoptile (Fig. 1). This grows rapidly, increasing in length from a few millimetres to about five centimetres within a few days (Fig. 2). At about 20° C the growth of the coleoptile ceases four or five days after the germination of the seed when the first leaf breaks through its tip. The coleoptile is thus the structure which thrusts through the soil guiding the shoot system upwards and towards the light. It is extremely sensitive to the influence of both light and gravity. If a seedling is grown in darkness its coleoptile grows vertically; if the seedling is placed on its side, within ten minutes the coleoptile begins to bend upwards until it is again growing vertically. This response to gravity is called negative geotropism (as apposed to positive geotropism, exhibited by the primary roots

which grow vertically downwards). The response to light, phototropism, is equally rapid and results in the coleoptile bending towards the source of illumination. The curvature is caused by unequal growth on different sides of the coleoptile. Darwin showed that the phototropic response was abolished if the tip of the coleoptile was enclosed in a darkened cap, even though the lower, growing regions of the coleoptile were exposed to unilateral illumination. The phototropic response could not therefore be due to the direct effect of light on the growing cells. He concluded that the extreme tip was responsible for detecting the direction of the light and that some influence passed downwards from the tip which caused more growth to occur below the shaded side.

This conclusion was confirmed and greatly extended in several laboratories in Germany and Holland in one of the most fertile periods of botanical research, the 1920's and 1930's. It was found that removal of the coleoptile tip led to cessation of growth; that replacing the tip enabled growth to be resumed and that asymmetric replacement of the tip led to asymmetric growth, i.e. curvature (Fig. 3). In this way the tip was shown to be the source of a growth stimulating chemical, which was given the name of auxin. This growth hormone was purified and found to be a fairly simple chemical, indole acetic acid, active at amazingly low concentrations: one hundred thousand millionth of a gram is sufficient to restore growth in a coleoptile whose tip has been removed. The growth of coleoptiles in response to auxin is in fact used as a means of detecting and quantitatively estimating auxin and is a thousand times more sensitive than the best chemical methods available.

Auxin was soon shown to be involved in the control of many other aspects of plant development: the initiation of roots, leaf fall, the breaking of dormancy in the spring, and cell division and differentiation. Synthetic auxins are used extensively in horticulture and agriculture, as 'rooting hormone' for cuttings, to control flowering and to reduce premature fruit fall, as selective weedkillers, and, lamentably, in American chemical warfare as defoliants.

Meanwhile, back in the oat seedling the discovery of auxin led to a fairly simple explanation of the phototropic response: unilateral illumination of the tip causes auxin to move laterally towards the shaded side whence it moves downwards causing greater growth on that side of the coleoptile. An analogous explanation accounts for the geotropic response. When a coleoptile is placed horizontally, auxin moves to the lower side of the tip leading to

greater growth on the lower side of the coleoptile producing an upwards curvature. Gravity is detected in the cells of the tip by means of starch grains which roll to the lower side of the cells and in some way which is not understood cause the lateral movement of auxin.

So far so good. But how exactly do minute quantities of auxin cause cells to grow? No one knows. Isolated sections of coleoptiles can be floated on water and in the absence of auxin little or no growth occurs. On the addition of auxin growth begins within a few minutes. This simple experimental system has been studied intensively for over thirty years; at present it seems likely that at least the initial effects of auxin are due to an effect on the membranes of the cell, changing their permeability and thus altering the environment of the cell wall which surrounds the cell. The cell wall (containing cellulose and pectin) is normally rigid and does not allow the cell to expand, but soon after the addition of auxin the rigidity of the cell wall decreases and the cell is able to grow. This decrease in rigidity could be due to enzymic breakage of certain chemical bonds within the wall, or to a change in the salt content, or to an increase in acidity. The idea is that auxin could cause the membrane of the cell to release an enzyme, or to pump salts in or out, or to pump out hydrogen ions creating an increase in acidity, as the case may be. It is surprisingly difficult to devise experiments which unequivocally decide between these (or other) possibilities.

Since auxin plays such an important part in the regulation of growth and development in plants, the way in which auxin itself is produced is of great interest. In general it is formed in the parts of plants where active cell division is occurring : in shoot tips, root tips, developing leaves, germinating seeds and thickening stems. This general correlation between regions of cell division and auxin production led to the hypothesis that auxin was produced by the dividing cells themselves. There has never been any direct evidence for this view, but for thirty years it has been generally accepted. Recently, however, an alternative and radically different hypothesis has been proposed : auxin is not produced by living cells at all but is formed as a by-product of cell death. It is easy to demonstrate that dying cells not only of plants but also of animals, fungi and bacteria release auxin as the protoplasm breaks down. This is because the immediate precursor of auxin is a common amino-acid, tryptophan, present in most proteins; as the proteins break down

tryptophan is released and then undergoes further degradation to produce auxin. But are dying cells present in regions of active growth? They are. In germinating seeds the nutritive tissues (endosperm and cotyledons) break down to supply the growing seedling with the substances it needs for its growth. In root tips, shoot tips, developing leaves and thickening stems new wood (xylem) cells differentiate to form the conducting channels for water which moves through this continuous system of miniature tubes from the roots through the stem and into the veins of the leaves. As the xylem cells differentiate they die: the living protoplasm decomposes and leaves only the cylindrical wall of the cell. Further evidence for this theory of auxin production comes from the analysis of senescent leaves in the autumn. As the leaves turn yellow and die, large amounts of auxin are produced. It seems therefore that dying cells are the source of auxin which then promotes further growth and further differentiation and thus further auxin production. There is an element of positive feedback in this system which may in part explain why plants, unlike animals, are constantly growing. If cells are killed as a result of wounding or injury, the cells around them grow and divide, sealing off the wound. This wound response has been known for a long time to be due to substances released by the dying cells. The production of auxin by dying cells can explain the wound response and enables it to be seen as a different aspect of the same phenomenon which regulates normal cell division in the plant. The only apparent exception to this theory of auxin production is the coleoptile tip: there is very little cell death here or, indeed, cell division. The coleoptile grows by the expansion of pre-existing cells. The answer to this paradox has only recently emerged. The coleoptile tip does not in fact synthesize auxin at all, but auxin from the seed is carried upwards in the transpiration stream through the xylem and accumulates at the tip, whence it moves downwards through the living cells.

The way in which auxin moves downwards from the tip into the lower, growing parts of the coleoptile is by no means simple. The speed of its movement, about one centimetre per hour, is far higher than simple diffusion; the auxin is in fact actively transported downwards by the coleoptile cells. This auxin transport can be studied in sections of coleoptiles removed from the plant. Perhaps the most remarkable feature of this process is that it is strictly polar: auxin will only move downwards and is not transported at all in the opposite direction, i.e. towards the tip. The polar trans-

port of auxin (in contrast to the sideways transport of auxin which occurs in the tip under the influence of light or gravity) is not dependent on gravity : if a coleoptile section is placed upside down, the auxin is transported upwards. The cells must therefore have an inbuilt polarity; they must 'know' which end faces towards the tip, and in isolated sections their polarity persists : even if the roots and tip have been removed the cells know where they ought to be. Auxin is the only substance which moves in this way and the polarity of auxin movement is responsible for the polar behaviour of all higher plants. For example, if cuttings are made from willow twigs, roots form at the basal end and shoots at the apical end not in response to gravity but as a result of the innate polarity of the cells : if the cuttings are placed upside down, the roots are still produced at the morphologically basal end (as a result of the accumulation of auxin) even though this is now uppermost with respect to gravity. The mechanism of polar auxin transport is very mysterious. It may be closely related to the mechanism of auxin action in causing growth, and the solution of one of these problems could shed considerable light on the other.

Phototropism is only one of the responses that plants make to light. It is well known that plants grown in darkness become etiolated : long thin straggling stems are formed. In etiolated oat seedlings the growth of the coleoptile is reduced and instead the stem below the coleoptile, called the mesocotyl, grows to a length of several centimetres, whereas if the seedlings are grown in the light the growth of the mesocotyl is almost completely suppressed (Fig. 2). This inhibition of mesocotyl growth is extremely sensitive to illumination and even a brief exposure to light is sufficient to bring it about. But this effect is based on a different mechanism from the phototropic response : phototropism is caused by light in the blue region of the spectrum, while etiolation is suppressed by red light. This red light effect has the extraordinary property of being reversible by light of a longer wavelength, in the far red region at the limit of the visible spectrum. Thus if oat seedlings grown in darkness are exposed briefly to red light the growth of the mesocotyl is suppressed, but if the red light treatment is followed by an exposure to far red light, mesocotyl growth continues as if the plants had been grown in continuous darkness. A similar set of effects were found about twenty years ago to be involved in the germination of certain varieties of lettuce seeds. The germination of these seeds is promoted by red light but a subsequent exposure

to far red light cancels the response; if the seeds are exposed to alternating periods of red and far red light the quality of light to which they were last exposed determines whether or not they germinate. These experimental results led to the hypothesis of a light sensitive pigment capable of existing in two interconvertible states, a red light absorbing form (P_r) which is physiologically inactive but which on exposure to red light is converted to a physiologically active form (P_{fr}) which if exposed to far red light reverts to the P_r form. This hypothetical pigment, named phytochrome, was eventually isolated and purified from oat seedlings. It is a blue protein and even in the test tube undergoes reversible changes on exposure to red and far red light.

Many other responses of plants to light were subsequently found to depend on phytochrome: for example the measurement of day-length by leaves, controlling the initiation of flowering, and the control of sleep movements in species whose leaves fold up at night. Attempts to explain the effects of phytochrome on the suppression of oat mesocotyl growth in terms of auxin were unsuccessful; it is now clear that P_{fr} can affect the growth of cells directly without the intervention of hormones. Its effects on growth could be due to some sort of effect on the cell membrane; but this is only one of its possible effects and, like auxin, it may well act in different ways in different situations.

The red-far red interconvertibility of phytochrome is an interesting experimental trick; but recent evidence suggests that it may be of considerable ecological importance. It has been known for some time that many weed species begin to grow in woodland as soon as trees are cut down. The seeds of these species remain dormant until the stimulus of light falling on the soil frees them from dormancy. Sunlight has a relatively high red:far red ratio which converts phytochrome into the P_{fr} form and promotes germination. But light which has passed through a canopy of foliage is poor in red light (which is absorbed by the green leaves) and has a low red:far red ratio which inhibits germination. So the phytochrome system not only enables plants to respond to the quantity of light but also to its quality.

Phytochrome and auxin provide two important sets of explanations about the control and integration of plant development. In addition to auxin four other plant hormones are known to exist. The orderly development of a plant must depend on the interaction of these basic control systems with each other and with influences

from the environment. Something is known about these interactions at the physiological level; there is every reason to hope that much more will be found out about the cellular and molecular mechanisms of action of the plant hormones and phytochrome. But we are still far from a satisfactory understanding even of the oat seedling.

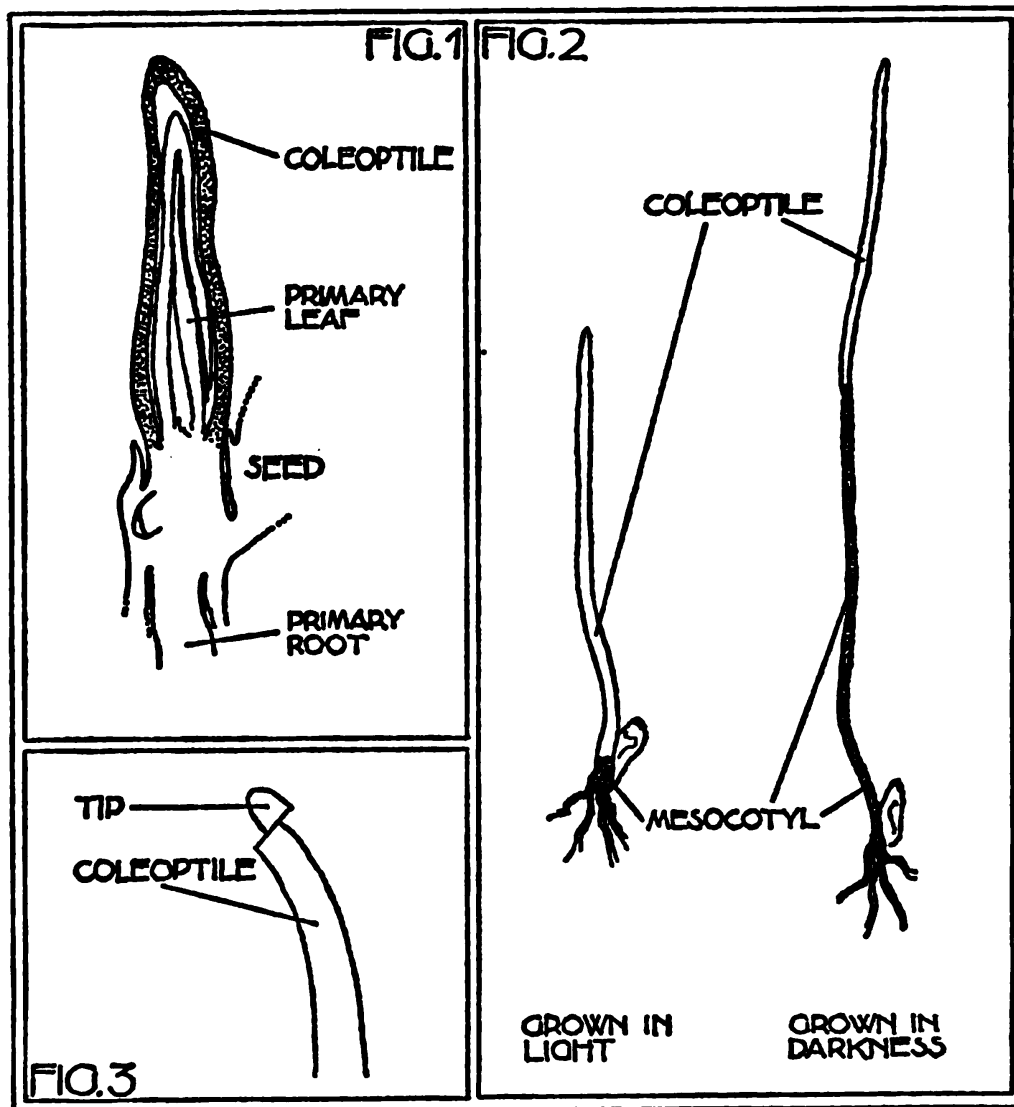


Fig. 1. Longitudinal cross section of a young oat seedling (magnified).

Fig. 2. Five day old oat seedlings, one grown in dim light, the other in darkness. Both have reached the stage at which the primary leaf is about to break through the coleoptile tip. The growth of the mesocotyl in the light-grown seedling has been suppressed.

Fig. 3. Curvature produced in a coleoptile whose tip has been removed and replaced asymmetrically. More growth has taken place on the side beneath the tip.

People need Fires

O. S. Pound

Note by Tim Eiloart

People need fires. No need to be romantic about the wood-fire, the smell of oak-chips, children bringing in fir cones and bits of green which must be accepted despite the spluttering incoherence of the ensuing fire. Wood fires are necessary. How many house-buyers wish they could insist on a fire-place. "It's a bit old-fashioned and makes more work, but we do so like a log-fire; and we can always use the central-heating if Tom feels lazy about the chopping". "They're so lucky. They have a real fire-place – one that draws, too!" In truth we are jealous of those who have such fires. Why? Perhaps it's symbolic. From about 400,000 B.C. when man, caves and fire are first found together (in Northern China), we have drawn more than physical warmth from the hearth – psychic warmth, perhaps? Whether roasting chestnuts or thoughts we can, in front of a log-fire, reflect on transitory things . . . "we are but smoke" . . . or enjoy them. How many assorted kinds of marriage have come about through the glow of a winter fire. Without such fires we become dehumanised, burnt-out human beings. The symbols that bind are mostly gone – the Cross and the Cup barely survive. Must we see the oldest of our symbols, the open fire, vanish into a trellis of wires and armour-plating inside a storage-heater – all for the sake of administrative neatness? People need fires they can see and smell. I wonder how many Ministers and senior Civil Servants unfold the day's left-overs from the Ministry out of a worn briefcase before a good log-fire?

Notice is hereby given . . . in exercise of the powers conferred under the Smoke Control Order of 1971 that a specified area, bounded by a line from the junction of . . . is declared a Smoke Control Area. Does this Order include you and your neighbours? No more smoke and general pollution. Fine! And anyone who has seen, felt, smelt and stowed within his lungs the billowing muck of pre-war Manchester will appreciate this. Even more so now, since the introduction of strict controls throughout what is now a clean city. But despite this vast improvement, one small wisp of disdain for human beings enters in. Wood fires, or more precisely,

the smoke from wood-fires will be forbidden, and only solid smokeless fuels, electricity and oil-heating will be allowed. By all means cut back on dangerous pollutants, but why wood-fires? Are we a nation of Black Forest wood-choppers, or would-be dippers in perpetual wood-stoked sauna baths? Surely the few wood-fires that still fascinate us are too few to justify their inclusion in such an edict, and an evening's well-being in front of a small economical log-fire helps to keep down the potential applicants for Mental Care (note the economy to the N.H.S.). Such an evening calms, soothes, brings together young and old (for television rather than story-telling, but no matter); and all are free in thought before such fires, safe from the world's administrators. A touch of the country has come back to town. Let us re-habilitate our cities by bringing the country back into the city – with the quick flush of pine and the warm glow of oak or beech. We can't all spend our week-ends in country cottages, leaving the city behind us.

Wood-fires are therapy. A note from the concerned organisers of a Retreat Centre in Cambridge. (Where students are gathered together, Retreats are needed.) People come to this Centre to re-create themselves after periods of exceptional stress and strain. The Centre offers quiet, an orchard, and a building mid-town. Splitting and chopping wood is a common activity – promoting shirtsleeve co-operation. And during last winter's power cuts these wood-choppers came into their own. What they had to offer was well within reach of their elbows. Therapy at little or no expense. No one wasting his life growing or providing goods that are soon ploughed under or scrapped for economic reasons. Is the Government to take away this pleasure and therapy under Section 11(2) of such and such an Order, without considering the simple needs of the young whose lives have become distraught through complexity, and the elderly who need to review their lives? All of us need to keep our spirits and bodies warm. We ask the Minister and those responsible for considering these matters to distinguish between belching furnaces and the few wood-fires that keep the distraught active and the elderly in reflective comfort.

All heating causes pollution, whether gas, electricity, coal, coke, or wood. So why include the least of these sinners in such sweeping edicts? Is Administrative neatness sufficient cause? Replace all log-fires with oil-heating – pollution remains, and the therapy vanishes. Is this sound?

A ninety-one year old, Mabel Watson, who died a few weeks

ago, was promised on her death-bed that her most recent poem (written in November 1971) would be published. Perhaps these few lines will increase the wisdom and understanding of those who make convenient paternal administrative decisions about our well-being.

OPEN FIRES

The householder today has many ways
Of warming his cold house in winter days,
There's gas and electricity and oil;
All do the job and minimise the toil.
How wise! How very wise to act like this!
And yet, is there not something that we miss?

When we are old and time is flying fast,
We love to dream of memories of the past,
And settle in a comfortable chair,
And fix our eyes upon the glowing fire,
And watch the dancing flames that rise and fall
And throw their shadows on the hearth and wall.
Ah! then indeed we may relax and rest,
And feel that open fires are still the best.

Note on the technical problems of domestic smoke control.

It is certain that a lot can be done to reduce smoke from a wood fire to a standard which would get past the Smoke Control Order. The problem is how much expense, effort, and maintenance would be involved. The following remarks only attempt to give a sketch of the technical situation. The technical literature which is relevant is vast, since almost every chemical industry has had to come to terms in some way with escaping fumes.

The classes of substances that came into question are:

1. Gaseous acidic oxides (and ammonia). Principally sulphur dioxide.
2. Carbon – soot.
3. Volatile tarry materials.
4. Ash particles.

Classes 2 and 3 are largely eliminated by complete burning of the fumes, thus producing the desirable glowing fire. Class 1 is either not affected, or actually increased, by complete burning.

There are a number of objectives we could now try to reach.

- (1) Meet the requirements of the bill by getting rid of all visible smoke.
- (2) Get rid of other noxious substances.
- (3) Improve the appearance of smoke without aiming at total removal but at least provide a reasonable emission. It is barely possible to see smoke coming from a chimney with a wood fire underneath anyway, so there is something to be said for a device that helps the frame of mind of the householder even if it is still possible with enough concentration to see the smoke.

Unfortunately most systems would probably be objectionable on some grounds to some people. Thus a good water scrubbing system might generate steam at the outlet to the chimney and apparently make matters *worse* on a rainy day. The steam would seem like a white smoke, and it wouldn't evaporate, it would merely disperse slowly. A fan which mixed a fast flowing stream of outside air with the smoke would cost very little and probably make the smoke *quite* invisible. It clearly doesn't actually clean the smoke at all. These are the two extremes, of a totally perfected cleaner which would receive lots of criticism and a totally useless cleaner which would appear to provide an excellent result. In between there are many other possibilities which would each have pros and cons and mostly be too expensive.

The different possible physical effects which have been used to eliminate fumes serve to define the following rough classes of method :

1. Washing or scrubbing with water.
2. Absorption by some chemical other than water.
3. Mechanical filtering.
4. Electrostatic deposition.
5. Deposition by mechanical vibration (usually high frequency sound).
6. Surface adsorption (by active materials, commonly carbon).

A first experiment is to try to make smoke drift up through loosely packed fibres or wool of some material and see how effective this is with soot. Upon the results of this experiment (which is the simplest application of method 3) would depend which additional methods were called in.

One possible design will have a throw-away packing and another might be cleanable with a vacuum cleaner. Yet another system is to use a rotating brush whose bristles are dampened by a fine water jet or by dipping in water. The whole arrangement might be self cleaning with the surplus dirty water running down a drain.

One would hope eventually to have a method which would apply to coal smoke also.

Getting rid of Cement

Irving Anshen

When a person paves his driveway, lays a walkway or perhaps builds a wall with cement he is working with one of the easy to use and relatively cheap building materials. One that is not only permanent but actually grows stronger with age thus ensuring that he has put down an imperishable monument to himself. One that may well be cursed by generations yet to come.

As a result of World War II there are in Britain and throughout the world miles and acres of concrete runways and other areas that are the relics of World War II airfields. The American Air Force alone left 73 airfields at war's end leaving more than 5,000 paved acres (73 fields times 2 runways plus service areas). To this we must add the surplus RAF fields which could easily raise the total to over 7,500 unusable acres. Think of it! Approximately 12 square miles of Britain is covered by concrete! And abandoned! Vitally necessary then – but utterly useless now. Currently there exists a great desire, especially in Britain, to return these lands to agriculture and/or greenery. However present economics makes it financially unsound to justify the labour of breaking up the slabs and runways and the resultant disposal. We have so far not been able to come up with any sort of scheme that would justify these costs. Of course beauty is its own reward – until the bill comes in!

Surprisingly enough in some parts of the world the very act of doing nothing produces something. A giant step is the breaking up of the concrete by nature's methods utilizing the inexorable force generated by the growing of flora. Those of us who have experienced cracked walks and driveways will understand.

Let us consider the first stage, the breaking up of these high slabs of concrete and miles of runways. This can be done very simply by cracking or drilling holes in the concrete and planting seeds in these cracks and holes. Over a period of years nature will pursue her relentless course and these roots of these plantings will break up the concrete. To be sure the process is slow but these runways have been there for some thirty years or more and we should well be able to wait another few. If the proper seeds were planted while this process was going on the concrete would soon be overgrown by "ground cover" plants thereby hiding the con-

crete mess and greatly improving the overall appearance of the area. Of course it could be done somewhat faster by the use of modern equipment – but the important thing is that it isn't now being done at all.

This slow, breaking up by nature's process is now in use in many islands of the South Seas. George Lee, who had been engaged in research in concrete with special emphasis on water resistant qualities under tropical conditions, has seen this procedure at work successfully, albeit slowly. The natives use whatever growth is at hand, in most cases simply permitting the local undergrowth to find its way into cracks that normally develop in hastily laid cement. Beech, Oak and Linden would work best under British conditions, even though almost any type of seed dropped into the cracks will sooner or later do the job. Never let it be said that British roots are not the equal of any on earth.

The disposal problem of the resulting chunks and pieces of concrete remains unsolved. There is not too much that can be done with pieces and chunks of concrete. This is further complicated by the fact that left alone concrete does not deteriorate as a result of weathering or ageing or anything else. There is no known method of disintegrating concrete. It just is! And is going to stay that way! The only apparent use is that of fill and the cost of handling and carting to the fill site makes this unworkable unless public or private monies were available to help defray the costs. To remove from both sight and mind the cement chunks could be carted to a port, loaded onto barges and dropped into the Atlantic Trench – if the same financial obstacles could be overcome. In some types of soil it might be feasible to sink pipes alongside the concrete chunks and flood the area underneath. If the underlying soil could be turned into mud of suitable consistency these chunks should gradually sink to a level consistent with the depth of flooding. Maybe as much as five or more feet. Then cover fill could be spread and the area brought into keeping with the surrounding countryside. This would be feasible only in limited areas where the soil lent itself to such treatment.

There are two lines of attack possible in turning this currently useless acreage into useful, or at least more sightly land. First, perhaps volunteer groups could be formed to deal with this problem similar to the Waterways Recovery Group – a group of young people who devote weekends and holidays to the physical labour necessary to the cleaning out and restoration of abandoned canals.

I am not sure that cement would have the same appeal as an English canal but the young are unpredictable, thank God!

Secondly there is the question of the moral responsibility of an industry to the country and life-style that nourishes it; or failing the sense of moral values there is always the practical one of public relations. It really doesn't matter what motivates an industry to public weal as long as they do perform the public function. The economics of disposing of surplus cementing is such that only public funds can do the job – OR a concerned industry. Now would be the time to begin to re-examine the relationship of any industry to the ecological and environmental being of the community. The after-effects of an industry must be evaluated and re-adjusted to the role that its products will play in shaping and influencing the life style and welfare of the country as a whole. It is no longer excusable to say "I didn't pull the trigger – I only supplied the gun!"

If the cement production industry could raise a fund to help underwrite the costs of disposing of these runways and areas they would gain the advertising value of this public demonstration of the lasting qualities of their product let alone a chance to once again prove their public spirit and high ideals. Perhaps there should be a joint public - private effort under the effective leadership of the cement industry. They would fund the project with their private funds and receive appropriate tax credits from the Treasury. But it is absolutely necessary that this work be performed.

A word of warning! As it now is with cement so shall it be with plastics and the time to fight this future problem is NOW. The Ides of cement are upon us! Beware the Ides of Plastic!

Review Article: *Simone de Beauvoir on Old Age*

Marie-Paul Vinay

(A critical analysis of "La Vieillesse", Editions Gallimard, Paris 1970. English Translation, "Old Age", Weidenfeld and André Deutsch, London 1972. The page references in the article are to the French edition).

This book is a *summa* on old age. Erudition triumphs here. Biography – raised to the level of weighty argument and abstract general ideas – is noticeable at every instant, and at times used to defend both sides of the same theory. Evidently, the material which has been accumulated is constructed on a politically oriented infrastructure.

The first half of the work floods us with cases of lewd, rich and powerful old people, of all periods and all nationalities. Generally, these monsters are seen as a product of societies of exploitation, and the book's conclusion predicts that in an ideal society the individual would be weakened by age but not diminished by it, and that he would die without undergoing degradation (p. 569). It is the system which is the great defaulter . . . But if one recalls the trials preceding the great purges in the Communist régime, one wonders about the gratuitous assertions. However, I share some of Madame de Beauvoir's views while differing from her on the definitions of "Society" and the "System" . . .

These theories on old age bear witness to a vast labour which augurs well for the vigour of the author, but it is more difficult than before for us to believe in her sincerity. How does she not see that what she asserts on one hand, she destroys on the other? In the establishment of this masterly compilation of illustrious old people, these accounts of visits to old people's homes, whose residents represent but a small proportion of elderly citizens, how is it that she never came across a fine old man, the beloved and venerable grand-father, or the good grandpa of our own families? How is it that she never wondered about the way great religious characters grew old and died, people who are renowned for their longevity: for example, the Carthusians? How and why has she not pondered over the typical old age of those among whom the

Church has made its saints? Might the answer be that in considering that world, she would have been in danger of discovering a picture of old age which is peaceful, confident, serene and yet animated by spiritual ardour, leading her to wonder whether the society producing such old people might not be the ideal society?

Do not think that Simone de Beauvoir was not aware of this magnificent counterpart to her work. Rather might one say that her head or heart often leads her in that direction, but quickly, a convulsive movement turns her away from it and she goes back to her former tracks.

Her book, whose incompleteness and contradictions we have just mentioned, starts by destroying current opinions on old age. First the ethical ones, or, more precisely, a caricature of moralists in a manner which suits the author's opinions. Then follow her ideas on the puerile and virtuous manners of behaviour towards the old until they give up the ghost, and, finally, the last blow – intended to cause a sensation – aimed straight at the “bourgeois” class (the Beauvoirian conception of it). From this the author passes on to scholars, enumerating various sorts of work done by them. The review is exact and true to life but the scope of scientific opinions on the subject is, in reality, much more complex and far wider than has been suggested by the author. She gives preference to absolute and sweeping statements. For example, that of Dr. Leach of Cambridge (page 12) who declares: “Everyone over the age of fifty-five must be scrapped”. What to think of this sentence and its synonyms? I wonder if one fine day (“fine” being a figure of speech) all these rejects will be scientifically – as opposed to naturally – helped to find a world which is also called “better” . . . If I were Madame de Beauvoir, I would be very wary of the world, even a socialist one, with regard to this . . .

The definition of old age used in the work is a banal one. It is Lansing's: “A gradual process of unfavourable changes, normally related to the passing of time, becoming apparent after maturity and always ending in death” (page 17). The general point of view of the author – who is growing old – is a very pessimistic one. Throughout the 570 pages of the volume echo the maleficent words of Montherlant, quoted on page 18 – “It is always said that a butterfly comes from a worm. In man's case, the butterfly ends up as a worm . . .”.

One by one the signs of old age are analysed with great application, but as early as page 38, for example, one discovers a quota-

tion like the following : “The singular disharmony between the strength of mind and the weakness of body brought about by old age, always strikes me and seems to me to reveal a contradiction in the natural order” (Delacroix). Although we are told, at the end of the chapter, that the miner has an average life-span of fifty years and the privileged that of eighty years, a little further on we find a table showing the ageing process in decreasing order, in the following way –

Teachers,
White-collar workers,
Manual workers . . .

underlying how the first function tires out its man.

Short incursions on the Yakoutes and other so-called primitive civilisations evoke appalling pictures of “living skeletons, hiding in corners and dying of hunger and cold” (page 53). The customs of those who killed their old folk, sometimes in order to eat them, are carefully listed. But of course there is no mention of the scientific murder, “euthanasia”, which is willingly committed on old people in modern societies and of which Madame de Beauvoir seems to be ignorant.

Some interesting but brief pages establish a correlation between the love of parents for their children and happiness in old age. But here too, a dissonance. Parental love, so handsomely rewarded, should be especially shown by permissive attitudes. I am not at all convinced about the future gratitude of children who have had the so-called fortune of having permissive parents. I shall not back that one as an insurance for my old age.

Further on (page 98), we are told that the problem of old people is above all a problem for the adult population, and this permits the author to associate – somewhat vaguely – the conditions of old age and property. The old people who belong to the exploiting caste are differentiated from the others (page 112). But would it not be possible to draw the same distinctions in any age of life?

Literature from Aristophanes to modern times, is thoroughly purged by the author of its patriarchs, heroes, hermits, saints whereas the luxurious, ridiculous or criminal greybearded fogey are recalled from the dustiest of books. There is certainly a word here and there on Christmas and the Holy Family but simply in order to warn us that these Christian mysteries sanctified childhood and maturity while forgetting old age. (But I used to stand

in fear of the diatribes inspired by a hoary St. Joseph.) We are told that in Christianity the Son dethroned the Father (p. 144). The author should be referred to the Gospel, where the Son states that He does nothing of His own accord but only that which the Father has told him to do, and to the

“Our Father, hallowed be Thy Name,
Thy kingdom come,
Thy will be done on earth as it is in heaven.”

It is understandable that some literature made fun of old people. Many of them have deserved it, but anyway of whom has literature, at one time or another, not made fun? On reading an account of an adultery, am I to say that adultery is the natural result of marriage, regardless of the husband, regardless of the wife? A conclusion to this historical and literary survey is that the ruling class have never sufficiently helped the old (page 228). How right Simone de Beauvoir is, alas! There has never been a surplus of goodness on earth, but to conclude from this that society – in an attempt to justify its savage indifference – has been obliged to devalue old age, is questionable. The devaluation of old age is rather the fruit of modern life, a consequence of the complacent cult of youth. These ideas, nowadays widespread, are in great danger of causing an increase in Welfare aid, in the hospital budgets and therefore in State aid, adding to the troubles of the taxpayer. We dare not envisage, and less so write about, the way this will happen.

Unemployment of people over the age of forty is bravely emphasised as are the consequences of early retirement. But these are vast problems beyond the scope of a treatise on old age.

An allusion (p. 225) to the Theatre of the Absurd, unfortunately too superficial and brief, is more disturbing than the revenge of the child – once oppressed by adults – on those degraded adults whom the old are. Vian's *Arrache-Coeur* is perhaps prophetic, and Beckett in *Fin de Partie* bears witness to the concerted efforts which – by the degradation of the old couple from dust-bin to dust-bin, by their sense of uselessness, of ugliness, of horror imposed on them – will perhaps one day urge them to go forward by their own initiative, not to dustbins, but to convalescent factories, calcium-fatteners. Isn't the aim of present manipulation that of inspiring a desire for self-annihilation among the undesirables? This kind of manoeuvring moreover is used not only with regard to the old.

Dr. Linden, of the Public Health department of Philadelphia,

states, on page 262 : “Among the factors which most contribute to the development of affective problems in our older citizens, must be ranked the social ostracism of which they are the object, the reduction of their circle of friends, the intense loneliness, the diminution and loss of human respect and the feeling of self-disgust [a reflection of that of others]”.

These conclusions are weakened in the following chapter, which is relatively well documented, on the efforts made by major States in the area of rehousing old people, for example. Madame de Beauvoir quotes inquiries, figures, statistics, many of which are sympathetic. As always research into the most extreme cases both of those helping and those receiving help, falsify the over-all picture but the work done remains interesting and . . . discouraging. Is it not the case that a statistic of Dr. Péquignot (p. 273) is followed by his conclusion on the vulnerability of old people to transplantation? 45% of the sample died during the first six months and 64.4% had disappeared before the end of the second year after their removal into old people’s homes. For her alone, these facts invalidate the movement towards better conditions within such homes. The psychological consequences of retirement are for the second time condemned for being instrumental in hastening the end or the degeneration of old people. It is, all the same, difficult to promote a lengthening of the years of employment at a time when our young people face unemployment. The answer to the problem might be rather in periodical recycling throughout one’s adult life and in a process of gradual retirement.

As Madame de Sévigné, quoted by the author on page 305, said : “. . . we go forward day by day. Today we are like we were yesterday and tomorrow like today; thus we advance without feeling it, and this is one of the miracles of Providence which I dearly love”. If, by a law of nature, old age arrives in fact imperceptibly, our social means of coping with it would be well advised to respect this condition of progression. This is moreover but one of the aspects of an immense problem whose consequences can be transformed long before they can be fully resolved. The essence of the matter is not the value granted to the old person but the value which he in fact possesses without the crutches of property, authority or organised delusions.

Madame de Beauvoir analyses the psychological problems of old people with as much repetition as perspicacity. The echo of her personal experience, of her movement away from the wall

which faces her, breaks through her analysis. She speaks about the agony of old age for famous men but she frightens us in letting us see what great age is for a woman of her standing.

Her upheaval is such that she returns, mainly under the cover of quotations, to the doctrines of her childhood. On page 327, she quotes Whitman

“To Old Age”

“I see in you the estuary that enlarges itself grandly as it pours into the great sea.” (*Leaves of Grass*).

This ocean seems nearer to the coasts of China than to the Cours Désir [Translator’s Note : the school attended by Simone de Beauvoir] but, with that exception, this quotation contrasts remarkably with the general tone of the volume.

The author feels it, knows it. Perhaps she is less free than she appears to her general readers, for she returns immediately, with outstretched paw, to scrawl at “the moralists”, on page 335. They are accused of claiming that old age liberates the individual from his body, meaning by that in particular from the sexual instinct.

These “hygienic-psychologists” (I prefer this term to that of moralists), are both right and wrong at the same time. The old person is in general liberated from the passions of the flesh but his bodily infirmities hardly give him a feeling of liberation. He appears mainly to be freed from the duty of filling his days with work and innumerable cares connected with making the fastest and greatest profit. This is surely an incontestable liberation. There remains the problem of knowing how to use this mental freedom. The separation of the weakened senses from the external world might well be ordered in such a way that at the end of his existence this earthly chrysalis makes for himself a sort of spiritual organism more capable of passing through death. Might he not also use his forced leisure in the study of the laws of a future world?

Madame de Beauvoir fears that world for she does not stop returning to the old libidinous men punished by it. “It is true that sexuality is not reduced to the genitals” (p. 336). The author then analyses in great detail, but in neither an original nor a specific manner, the various manners used by old people (we would suggest : some of them only) to attain what is conventionally called “pleasure”. The result, not in the best of taste, tends to attribute special behaviour to old age. But, continuing her system of oscillations, the author hastens to declare that sexual offences are less

common in old age than in the other ages of life . . . Various analyses of the love-life of more or less senile old men bring the fifth chapter to a close. One learns mainly that the old age of a man depends on what he was beforehand, in particular on his egoism and his pride. Altruistic old men like virtuous ones are rare in the volumes of this author . . .

However, on page 371, we are presented with this reflection of Schopenhauer's: "It could here be said that the sexual drive once extinguished, the true kernel of life is preserved". These words favour the thesis which we shall put forward at the end of this study. That old people live more through memory than by hope, that they choose to identify themselves with the character which flatters them most, that they are forever this "former soldier" or that "wonderful mother" (page 384), no one will dispute. The people who have allowed society or whosoever of its representatives to decide on their every belief and their every synthetic view of existence are unable to react differently. If you lack space in front of you why not go backwards? Many other ages in life are settled in this way. The observation, although interesting, is too general.

The dissolution of memory which makes the author declare that old people do not have a great past behind them, appears to us to be clearly wrong, for, whether one remembers it or not, the greatness of a lived past is not changed. If the author states that "in the funereal monuments which abound in my history, it is I who am buried" (p. 389), it is only sentimentally or poetically true. The works accomplished continue to live and to germinate whatever the outcome or the memory of their creators.

The culminating point of the volume is this confidence of the author (p. 390) :

"No life, no moment of any life could keep the promises with which (in my youth) I excited my credulous heart . . ."

and

"The present, even when conforming to my expectations, was unable to bring me what I wanted: The fullness of being towards which existence stretches in vain."

Behold the moment of truth in a being who is by nature frank but who, for various reasons, has been obliged, so often and so painfully, to move away from the truth, to abbreviate it, artificially to bring together pieces of it.

From these heights, to which we shall again refer, Simone de

Beauvoir, moves down to the present condition of old people in a society, to the materialisation of which she herself has greatly contributed: "Far from offering the old person a relief against his biological destiny by assuring him of a posthumous future, modern society (which changes so quickly) throws him while still alive back into a past which has been already lived" (402). How could it be otherwise when the human being, considered merely in terms of his social utility or of his personal pleasure, can no longer achieve either one or the other, but becomes a heavy and complicated responsibility? "The science of the wisest among them does not protect them from an increasing ignorance since the quantity of new things to be known far exceeds, in all branches of knowledge, the faculties of assimilation even of an adult" (p. 414).

The author informs us that intellectuals age badly. Which guards us against the intellectual sterility of old scholars. There are many, she says, who would without displeasure see the world destroyed, if not by them, at least at the same time as them. Like those princes buried with women, servants, horses, etc., these scholars would willingly descend into their tombs in the midst of a conflagration as enormous as they imagine themselves to be. But the author is not herself in favour of such destruction. "I need", she confesses, on page 435, "to prolong indefinitely this adventure in which my life is inscribed". Thus, in the last part of the sixth chapter, she studies the refusal and acceptance of death. A distant echo of the *Cours Désir* is audible: "The dread of death has its roots in childhood and adolescence. It is often associated with ideas of guilt." Which is true in itself, true in general, and true of the former pupil of the lay religious order of the Rue de l'Université. How painful, deep down, must be her renunciation of a faith whose care it is to satisfy all hungers, and of a philosophy which nurtures every noblemindedness! How tormenting the countless refusals which she must have made in order to preserve a love, a moderate adulation, a flattering self-image! Already the *Memoirs of a dutiful daughter* and then *The Prime of Life* contained outbursts which left us breathless, for the tragedies of souls move us more than those of bodies. But in the final volume, *Force of Circumstances*, one gets the impression that the "deceived" author has less, or perhaps nothing further, to lose. The life of the creature of superior intelligence, bent in the wrong direction, hurls frightening moaning sounds.

It is useless for her to add ". . . if the subject is a believer, he

imagines with terror that he is going to be precipitated into hell", for we clearly feel at this point that the subject herself is a believer! She was too well formed not to know that the forgiveness of Life is far more powerful than any human dynamism. In fact, she hopes for this forgiveness in the very name of the subjective greatness of her betrayal and of something else which is part of the mystery of her person.

This declaration, on page 610: ". . . one can see (for my part, I do not see, but it is not to be disputed that some subjects try to believe that they see) that a prejudice must be absolutely, resolutely, dismissed: that is the idea that old age brings serenity." Granted that Arina Petrovna and with her many others, including the author, lacked serenity, all with good reasons! But how many serene old people in non-Sartrean circles have we known. How many angelic souls like that old couple from Quebec, surprised by the unexpected walkers that we were, one day in Spring, who were alternately reciting the Rosary, and inviting us to finish it with them before resuming a more determined walk. These old people, both with equally blue eyes, in the bareness of a poor farm with neither radio nor television, told us that nothing brought them as near to God and to each other as that simple prayer said by them in the name of workers who were too busy to think about Him. They thought about their new Home to which they were so close and laughed like children as they wondered which of them would be the first to go and lend a hand to the other. The doctor had just told them that their ninety-year-old hearts were at the end of their tether . . .

Madame de Beauvoir's hope shines through again on page 516 when she says "in childhood and youth existence is lived as an ascension . . . the idea of ascension persists in maturity. Suddenly one discovers that one is going nowhere, apart from to the grave. One has drawn oneself up to a summit only to realise that it is the point of departure for a fall. She then recalls how Yeats said life is a long preparation for something that never happens; and again, that if *all* was vanity or a hoax there would be nothing to do but await death. But to concede that life does not contain its own purposiveness does not mean that it cannot dedicate itself to aims. This is to be found on page 517, followed by "There are activities which serve men, among which are relationships where they fulfil themselves, in truth." And, on page 567, "So that old age may not be the derisory parody of our former existence, there

is only one solution, that is to continue to pursue those aims which give a meaning to our life". And finally, "Old age denounces the failure of our civilisation. *It is man in his entirety who must be remade*". Oh how we agree with the author on this the penultimate page!

And what essentially are old people? Surely, the inheritors of the irregular growth of their past, the potential victims of a deficient circulation, but also and above all, beings who have gone beyond the limits of one sort of life and in whom, through and in the death of the first, another life is being sketched. The sensorial doors of their being are closing and, in the chiaroscuro thus produced, other forms of seeing and hearing – which transcend those of this world – are being found. The old person, who does not reject it, understands life and the meaning of life better than he ever did in his youth. Not many truths occupy his mental horizon but they are enough to mould his mind to make him capable of crossing frontiers which are near at hand. Silence, relative obscurity, pain and infirmities which kill pride, make him experience his relativity, favour the flourishing of wisdom. Beneath the shell of interior solitude, repentance and nostalgia meet.

The old person is seen by some as one who is to die first, already marked by death, one who stands between the observer and his own end as a protection and a warning. For those who believe, he is the ambassador, the next intercessor, the friend leaving for distant lands charged with the task of preparing the later arrival of his friends. Whatever his ailments, he is respected with anticipated gratitude and also for his function of representing his time and people in the Last Kingdom. Many beings feel their immortality. They have an intimate experience of it. Madame de Beauvoir is of this number and said so much when she told us of her hunger for existence.

Why does modern society want to destroy and uproot all hopes of immortality? What harm is done by those old people many of whom have lived well in order to die well and to merit a peaceful rebirth? In the name of what maleficent power should we extinguish the hope of those who are going to die? In cutting man off from his roots and from his aims, what is one's intention, if not that of manufacturing a creature-object, a sort of thing ordered for the triumph or pleasure of a minority? The robot-man?

Let us move then in the direction of the account or, better still, the sight of those beautiful deaths full of faith, resignation, filial

love and even ardent curiosity. Where is the man or woman who would want to extinguish in the dying person not just the sight of his eyes but also that of his heart and intelligence? To steal the day, the sun, is to kill. What is this death that our moderns wish to be ignominious and absurd? What is this crime: the theft of a human death which is consoled and consoling? Who would give some the right to commit it?

They cannot excuse themselves on the pretext of interest in the truth, for they do not know where the truth is. The faithful can, by grace, have some light on these matters but the non-believers know absolutely nothing about them. Which of them has experienced a death and resurrection? If they do not know, let them seek and it will be answered them. On which side is the good of man to be found? From whom can society benefit most?

Is it from those who think that however one has led one's life, the end is absurd for everyone, never being a consolation but always a means for despair? Will they therefore not encourage the opacity of mind or the search for the maximum pleasure, the survival of the fittest with its subsequent injustice, tyranny and crime? Is it from those who know or believe in the personal and social value of everyday life and its relation to the loss or gain of happiness in the after life?

Will not both of these sorts at least try to live according to a fixed ideal, try to do unto others as they would be done by? Logic and intelligence are capable of finding a solution to the problems of human life from youth through to old age. Every civilisation contains some individuals who bear this out. Ours too. We therefore reproach Madame de Beauvoir for a silence which is unfair, for a discrimination in her use of statistics, and for a too biased use of her vast intelligence.

It is definitely man in his entirety that we need to remake, a man who would be free to join his life with his own ancestors as much as with his society, free to live according to his beliefs, free to soar upwards at the moment of death towards new abodes built for him by paternal love.

On the other hand, no science would dare to gather together so many observations on man and his old age without suspecting that nature never organised this mess, this absurd disjunction, this perverse effacement of human life in its decline.

Has not every one of us felt himself at some time called upon to transcend his human weakness, his brief terrestrial journey?

Madame de Beauvoir herself confesses to such emotions. Every young person knows that youth is an ascension, every adult experiences his life as a journey on intermediary levels between consolidation and a continuous going beyond his present ambitions. Every old person is gnawed by the certainty of scarcely having begun his life's work and his days seem but a night's dream. He feels that he is promised to a future at the very moment when death touches him. Is man then less than the seed which once sown dries up, wrinkles and dies while shooting towards another mode of existence? Are human wrinkles the only ones not to speak of fecundity? Of germination? Why should the human body have a lesser destiny than the smallest of seeds?

Why should nature, so wise and marvellous in the plan of its crystals, vegetables and animals, be suddenly deaf and blind with its masterpiece: man? Are the forests of dead wood to reflower each year under our eyes without teaching us anything? Perhaps every one does not have religious faith; some reject it; others have fallen away from it; and others again are still at the stage of the way which leads to it. Madame de Beauvoir has a scientific mind, but also a proud soul which refuses to disclaim her past, and perhaps a loving heart which does not want to condemn. In her book on old age, she envisages this journey from the corporeal to the spiritual and even from the relatively spiritual to the purely spiritual, from the worm to the butterfly. In spite of her back-stepping, her denials, her conditioned reflexes, she is still waiting for that fullness of being which is assured for her by a spiritual feeling sharpened by a sincere love of others.

She knows that her existence reaches out for the satisfaction of that need, but such a waiting cannot be deceived because it expresses that order of all-powerful Life of which Knowledge uncovers a greater piece for us each day.

Madame de Beauvoir is still a believer, her book bears witness to it, and she is already moving more humbly towards that face-to-face encounter when every mind, in perfect light, makes its choice between Being and Nothingness.

Hers is a fine book where, amidst lumps of mud, a soul rises up towards the light.

Comment:

Christian Activity and Contemplation

When Damaris says in the Dialogue in T. to T. VI i that “Christianity is a religion for activists” she doesn’t mean that it is a religion of action – doing good without contemplative depth (though she might be taken to mean it). Would it be true to say that the contemplation and union go, or can go, so deep that they produce the two things which cause the “activist” movement – sensitiveness, very powerful, to need, and absolute readiness to do whatever may help it, in any direction? It is something like coming out right on the far side of the *via negativa* and working back from there.

It is a *very* good dialogue. All three contribute so much.

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“Mao and the Dark Aspects”

Charles Musès, who wrote the comment we published in T. to T. VI i on Joseph Needham’s article on “Mao and the Dark Aspects” writes :

“You left out the key sentence (inadvertently, since the hiatus was not indicated) that one of Mao’s central dicta is that ‘all power flows from the barrel of a gun’. The statement is essential to the argument – all the more so because Mao is quoting Hermann Goering’s earlier policy statement : ‘power comes out of the barrel of a gun’ ”.

We apologise for this piece of inadvertence. Charles Musès also sends us this further information about his scientific work and interests :

“It would help the reader to know that a forthcoming general survey of the nature of consciousness, with relations to mathematics and physics, edited by Arthur Young and myself will be published by Outerbridge and Lazard, N.Y., June 1972, and that two of my previous books are *Schopenhauer’s Optimism and the Lankavatara*

Sutra (Watkins, London, 1955) and *Dionysius Andreas Freher: Illumination on Jacob Boehme* (Columbia U. Press, 1951). I also edited *Aspects of the Theory of Artificial Intelligence* (Plenum Press, N.Y., 1962) the proceedings of the first international conference on biosimulation, held at Locarno, Switzerland, in 1960 and chaired by the late Dr. Warren S. McCulloch of M.I.T. At present I edit the *Journal for the Study of Consciousness* and serve on the editorial board of the *International Journal of Bio-Medical Computing* (Elsevier, England).”

Buddhist Meditation

I have followed the discussion on Buddhist meditation with keen interest. I think, however, that one point which Derek Wright made requires rectification. I do not consider that he has properly understood and/or expressed the *raison d'être* of Yoga. He suggests somewhat glibly that certain practices of Yoga which are geared to 'shut out everything' imply 'that the goal of practice is to turn you into a sort of vegetable'.

Besides the obvious fact that this would be a total physical impossibility – unless one were to interpret his words as referring to a kind of long-term process in the sense of re-embodiment –, it represents a regrettable (and regrettably common) misconception about Yoga. It is quite amusing to see how Freda Wint takes up Derek Wright's howler and throws a few more stereotyped ideas into the conversation: 'a bit extreme' (reluctant), 'They maltreat the body' (definite), 'There's heroism in it' (condescending?).

Having carried out some research into Yoga and related subjects, I have come to accept that any discipline or system by which a change of consciousness is aimed at with the purpose of reaching the Core-of-Being, the Self etc., can take either of two directions: it can seek to achieve its goal by stepping out of the empirical universe altogether through realising a kind of Cyclopean existence – or else it can endeavour to realise the goal within the orbit of empirical life. As these two approaches have been delineated and labelled variously by others, I personally am content with a circumscription of their essential character.

It is significant, I think, that whereas these two 'paths' (better :

approaches) have been known and accepted as what they are throughout the long history of Indian spiritual striving – and even a sworn ‘monist’ like Sankara did not reject the latter possibility, *i.e.* of spiritual living *in* the world – in the West we somehow tend to associate the path that leads *through* the world with ‘right’ and ‘good’ and that which *lies beyond* the world with ‘wrong’ or at least ‘inferior’ or ‘a bit extreme’. To me this appears to be the expression of a certain intolerance born from a fundamental misunderstanding of what each approach means. True, we also find this denigration of values in the Buddhist world where one speaks of a ‘lesser’ and a ‘greater’ vehicle – Hīnayāna and Mahāyāna – the one associated with selfishness, the other with compassionate saintliness. But besides the fact that these terms are late inventions, there is no natural ‘grammar’ which compels us to think that blemishes in another excuse one’s own faults.

Any spiritual practice or experience must of necessity be ‘extreme’, because it is the exact opposite to what is normally done, felt or thought.

Maltreatment of the body has never been advocated by Yoga although there are always those whose over-enthusiasm leads them to become bad advertising for the system they cherish. Yoga is essentially ‘balance’ (*samatva*), as the *Bhagavad-Gita* (one of the oldest Yoga scriptures) says. I think any modern yogin of authority would approve this. However, the scale-division of this ‘balance’ is a twofold one, according to whether the measure is laid *across* the world or whether it is taken as from its ‘antipodes’; and here, I feel, personal preferences ought not to cloud one’s judgement.

G. A. Feuerstein

Yoga Research Association.

A Theophany

Clare Campbell

Sophocles' *Philoctetes* ends with an Exodos which has to my mind been little understood. It consists of a human decision, apparently flatly contradicted by a theophany eight lines afterwards. Nothing happens in a good play, let alone a great one, solely in order to be undone again immediately afterwards. In a recent undergraduate production for which I made the translation quoted from below, we tried to convey a view of this ending as not after all opposing, but profoundly integrating, divine and human values.

The scene of the play is a desert island, as hostile to survival as Beckett's dustbins, though with its own stark beauty (extract g.). Odysseus, a man who does right only if he can reach success that way and treats persons as things or tools (extract c.), marooned Philoctetes here ten years ago because his morbidly unhealing snake-bite in the foot made him sinister company. But a prophecy has said Troy will not fall unless he is "persuaded" to bring his magic bow to attack the city. Young Neoptolemos, third main character in this triple concerto, is Odysseus' moral obverse – "I would rather fail from a good motive than get the desired result by evil means" – but in the opening scene he is perverted by Odysseus into telling a lie that will get the castaway on board ship thinking he is to be taken to his own home. Utterly trustful of a youth who has turned out to be his friend Achilles' son, Philoctetes exhausted by a sudden attack from his wound hands him his bow for safe-keeping. Neoptolemos, disturbed by pity and qualms of conscience, hangs onto the bow but confesses to him when he wakes that in reality he will be taken to Troy. The enraged hero would rather die than do anything that helps those who marooned him (understandable Greek heroic ethics, though they are not left uncriticised), and death because he cannot shoot prey to eat seems inevitable when Odysseus rules that since he will not come with them they will take the bow and leave him behind. By a typical Sophoclean paradox, the loss of his invincible weapon shows us his spirit at its most invincible.

However, Neoptolemos in a moment of insight had interpreted the prophecy to mean that to take the bow without its owner would be useless as well as shameful. And when he is first allowed

to touch the bow he utters a crucial line (surprisingly ignored by commentators, line 673) which in Greek plays on the hero's name*; a man who returns kindness for kindness, he says, is "a stronger friend than any possession". Persons matter more than even magic objects – an ethic Odysseus, who construed the prophecy to the opposite effect, would never understand. So Neoptolemos defies and crows his superior officer and gives the bow back. (He had earlier relied on the S.S. guard's excuse, "if a subordinate does wrong obeying orders, his superior is to blame".)

The crime of the play's temporal action, the theft of the object, is now "undone" (line 1224). But Sophocles' plays tend to contain a greater action which the stage action mirrors. The greater crime against the person, of ten years' standing, is still in continuance. In my view it is this which Neoptolemos goes on to "undo", by an equal and opposite gesture, when he yields to the challenge "take me home" and crosses the stage at the start of the Exodus to side unconditionally with the outcast against those who wronged him. He has everything to lose by doing so; he opts for failure, because it is right, and the heart-warming relief one feels can hardly not be intended and endorsed by the playwright. But the action is like a pendulum swing, containing inherently a momentum capable of carrying both men back with it. It is an act of reclamation, of spiritual healing, which cures the isolation that was worse than the wound, as psychosomatic contrasts in the language throughout have led us to feel (extract e. The dramatic construction secures the same effect, for the snake-bite attack is followed and capped by the scene of horror at a friend's treachery, which rightly acted should seem "sharper than a serpent's tooth").

Now that all is redressed at the personal and moral level, the externals of wound and bow can go forward to their destiny of healing and conquest. And so enter Heracles with perfect timing. He is the archetypal friend who first gave Philoctetes the bow, now deified, and, if one may modernise, now visible because a signal deed of friendship has raised the action to the pitch at which men see gods. When Heracles now says both men should go to Troy, not home, Philoctetes freely agrees – he has been healed in his social nature, so he can accept physical healing, and it is in the logic of his plight that it will happen at Troy, when he rejoins the Greek body politic which had cut him off just as in despair

* *Philos* means friend and *-ktetes* is from a root meaning possess.

he used to want to cut off his own foot. He can trust again; he has been welded with Neoptolemos into the team of two fast friends which is what the gods were waiting for to bring about Troy's capture (extract g.), for the bow is only friendship's tool. Surely all this was a man's doing, even if it took a god to clarify that the hitherto blocked direction of journey was now open. (If Neoptolemos had seen that consequence, his motives would have been impure.) The man who opted for failure has succeeded, where the man who stood for success had abjectly failed. "He that will lose his life shall find it".

There is something of the Jesuit about Sophocles, with his immense cleverness, seeming to urge upon the simpler ones of us with archaic smile that we should believe in the literal truth of miracle and pantheon, while he builds a structure of spiritual truth so self-supporting that it needs no validation but its own.

Our production sought to synchronise Heracles' entry and Philoctetes' words "oh noble choice!" and orchestrate them with light as a single great moment. The god is not seen by those on stage till he speaks eight lines later; but I suspect that existentially there is only one event in the Exodos, not two.

I should like here to pay tribute to the powerful and deeply committed undergraduate actor who took the play's name-part.

Postscript.

Since I wrote this I have been asked to meet comment that its account is moralistic rather than religious, and says little on the intellectual problems of fulfilment of prophecy, the reconciling of divine providence and free will.

This last is an immense issue in Greek tragedy, requiring a whole article to itself. In this play I enlist etymology to interpret P.'s last words "I am persuaded" rather than "I obey", thus linking them with the oracle's "persuade him" and N.'s inference (clear from line 1332) that that meant get his free consent. That takes care of human free will. But if I deny that the god caused anything, exerted force majeure as distinct from embodying a re-think which could have happened naturalistically, have I not argued him away? Assuming as I do that N.'s goodness *caused* the re-think, the moment of illumination, I would still say that its *nature* was a cognition of superhuman reality, and that one should not water down the playwright's meaning there. Does Heracles then mean anything which a modern intellectual can take seriously? I can only reply along Kantian lines. Certainty about what ought to

be done is for Kant always metaphysical, indeed the only form of access we can have to a world more real than the phenomenal. There is much that is Kantian about this play; e.g. that persons are ends and not means, which is, I suggest, offered as a cognition not just a code of conduct – compare the Socratic “virtue is knowledge” – hence if one acts against it the stuff of the universe will prove one in error as it did Odysseus. The liar gets self-defeated in the same way. “Ought” is then rooted in “is”, as one suspects it was for Kant, though it is not for the artist to solve the theoretical problems of the “naturalistic fallacy”. In that case “moralistic” does not work as a pejorative term as it may do when you dichotomise facts and values. If there are anthropologically speaking three stages of religious progress, (1) gods as arbitrary physical power, thunderbolts from a blue sky, (2) gods as intelligible power which behaves consistently, Kitto’s “gods work like electricity”, (3) gods as good, the source and endorsement of human values, then the Greek tragedians were profoundly concerned with whether or not transition can be made from the second stage to the third, and morals and value judgments are consequently crucial for them. All right, the status rather than the content of such judgments may be the key point; it is precisely status, metaphysical authority, that Heracles gives.

Granted, the stuff of the universe also did not want P. to go home. Throughout the play the winds and currents are streaming Troywards, a clear case of cosmic collusion, which looks more like *Realpolitik* than divine endorsement of human values. I have rationalised a lot, but I would not argue this touch away as just poetic symbolism. I think probably Sophocles does believe that discrete parts of the cosmos can cooperate purposively – though they do not always do so under polytheism, for they each have their limited territory of freedom. Sea nymphs may cooperate with Zeus in this play but they defy him in *Prometheus Bound*. The thinking seems to me territorial in the sense that modern biology uses the term; the Greek words for fate mean “allotted portion”, one’s own garden plot within which one is free (if it contains a horrible slough like Oedipus’ territory, one is not free to leave it). The polytheistic universe is one of multiple initiatives, in which individual indeterminacies cancel each other out as they do in modern statistical concepts of natural law. The mutual territorial pressures create a complex pattern of boundaries throughout the cosmos which is fairly stable, an ecosystem, a web of fates or Fate

on which predictions can be based, and to which even Zeus is subject. It is really a system which has much less difficulty over fitting in free will than monotheism; for omnipotence is outside its concepts, though omniscience, the all-seeing eye of Zeus, is to some extent admitted. Many Greek play prophecies imply correct extrapolation of the curves of human behaviour, by an all-seer or allied gods who compare notes, rather than over-ruling of the behaviour. In any case, the prophecy in this play is hypothetical; and so in effect is Heracles' speech, since the present participle in line 1423 "Coming to Troy you will be cured" does not commit itself as between the meanings "when you come" and "if you come". Philosophy at its peril despises niceties of grammar.

*He is stricken without deserving –
 And my heart turns cold
 At the sound of the waves that have pounded
 year by year
 On his weeping head,
 At the tears of his lone endurance,
 How has he borne too much to bear?*

(b) the second crime

Phil. *Is it
 The discomfort that my illness causes?
 You've decided not to have me on the ship?*

Neoptolemos *All is discomfort, when a man betrays
 His inmost self, and acts against his nature! . . .*

Phil. *Your deeds are free of harm: your words alarm me.*

Neo. *Zeus, what am I to do? Must I be shown
 Twice guilty, of hiding the true facts from him
 And uttering the grossest fictions?*

Phil. *I'm no fool:
 This man is going to sail and leave me here.*

Neo. *Leave you, not I! But what I dread is that
 My taking you will grieve you even more.*

* * * *

Phil. *My hands, my hands! what can you do for me,
 Robbed of your friendly bow, and hunted down
 By this man's pack? (to Odysseus) Unwholesome
 brain, whose thoughts
 Aren't fit for a free man, how you have ambushed
 And stolen upon me, using this young boy
 Whom I didn't know, as cover for yourself:
 A use as much beneath him, as he was worthy
 Of me its victim; a boy who's learnt no tricks
 But how to obey orders, and who's now
 In plain distress of mind at what he's done
 And what I suffer. But your evil eye
 Has always looked through peepholes; and despite
 His nature and reluctance, he did well –
 Your coaching made him a skilled criminal.*

* * * *

Phil. *What catch shall I bring home
My wingéd weapons gone,
My hands' grasp empty?
A man's deceitful words
Ungessed, concealed,
Stole underneath my guard –
The planner of that deed,
Let me but know he spends an equal spell
In this my hell!*

Chorus *Destiny, destiny brought
These things to pass,
Our hands at least
Have played no trick on you;
Keep your hateful curses, keep them for others.
We fear for your own sake
You may be a man who pushes away friendship.*

Phil. *By the hoar-white fringe of the sea
He will sit and gloat,
He is there now
Flexing his hands
My secret livelihood,
Which none before held close but me.
Beloved bow,
Wrenched from the hands that loved you,
Do you glance around you pitiably,
Have you some faint power to know
Heracles' friend no longer handles you?
But by vile exchange
A man who plots and plans
Works you in his hands
To witness dark deceits,
A soul I hate and abhor
With his countless wiles
Like those which brought me down
Through you must compass more.*

(c) the man for success

Odysseus *So a stratagem of some kind must be used,
A trap, in fact, to be quite blunt about it,
If those unconquerable arms of his*

*Are to come into our hands.
 Oh, I well understand your reactions, boy.
 I know your inherited character is antipathetic
 To anything that smacks of foul play.
 But steel yourself, you future conqueror
 Of Troy! that will taste sweet; when that day comes
 You'll back my judgment retrospectively.
 Grant me one brief unscrupulous half-day,
 Then live a paragon for your life's remainder,
 And hear yourself alleged the best of men.*

* * * *

Od. *There's a great deal I could say in reply to him,
 If this were the right occasion. One thing shall suffice.
 Whatever kind of man a situation calls for,
 I am that man. When the enterprise in hand
 Demands a just and upright line of conduct,
 You wouldn't find me second to anyone
 In virtuous principles. But it's my nature
 Always to aim at what will bring success
 In each context. – However, as for you,
 I'm prepared to make an exception; I give way . . .
 Why should we need you? Range at your sweet will
 Through Lemnos. We shall leave you. Very soon
 Your prized possession will bring me renown
 Though you were meant to reap it.*

(d) are the gods just?

Phil. *But now for heaven's sake, why didn't Patroclus
 Help you? He was your father's dearest friend!*

Neo. *He too was dead. Here's the short moral for you,
 War never willingly takes rotten men,
 Only the finest.*

Phil. *Ah, I echo that.
 And what for instance of that ne'er-do-we'el –
 He was clever though, a mischief-maker –*

Neo. *Whom you can mean, other than Odysseus?*

Phil. *The name's – Pappadopoulos? – Thersites!*

Always chiming in

Neo. *Though never suffered gladly. Is he alive?*

Neo. *I've heard so. I don't know him.*

Phil. *He would be!*
Evil's shadow never grows less.
Heaven feather-beds it, shields its little finger,
Makes death-wounds deviate from the practised
villain
While just men drop like flies! What can one make
Of the Unseen? Despise it at our peril:
Respect it? – how? while gods do evil!

(e) the wound and the wrong

Phil. *Gods and men hate me! Total castaway!*
Not one Greek ear harrowed, not worth a rumour,
None of my cries reach home.
And those that crucified me to this spot
Laugh, and conspire with silence, while their malice
Feeds my huge gangrene day by day.

* * * *

„ *Boy, what a monstrous thing! that Laertes' son*
Should hope to work with wheedling words on me
And ship me and show me off to the assembled
Argives!

No – rather I'd obey my deadliest
Enemy the viper, who destroyed my foot.

* * * *

„ *For though life itself*
Is anguish to me, let me see them meet
Their just fates, and I'll think my wound has healed
And I have been delivered from my sickness.

* * * *

„ *Oh foot, foot,*
What shall I do with you in the time to come?
Turn back, turn back, good souls.

Chorus *What is the use?*
Have you repented of your former obstinacy? . . .
Come with us, wretched man; do as we bid you.

Phil. *Never, never, never.*
Jove's messenger his lightning streak from heaven
To visit me, his thunder's spear enflame me,
I will not come.

*Let Ilion perish first,
With all encamped beneath her walls
Who cut off from their compassion
This broken limb of me.*
(He goes on to ask for an axe to cut off his own limbs.)

* * * *

Neo. *The pain you suffer is no natural wound,
But supernatural . . .
And listen well, you can hope no release
From your dread suffering, while the sun goes on
Rising on this side heaven and sinking that,
Until you come to Troy – come willingly, in person.*

(f) the man for failure

Neo. *What shall I do? since I cannot persuade you
By any means at all.
I had better give up trying,
You had better live on as you are
In your own way, without recovery.*

Phil. *Yes: let me suffer what I have to suffer.
But what you promised with your right hand pledged
In mine, that is your unfinished business:
Take me home, son. Delay no more.
Forget Troy's very name. That wall of wailing
Has drunk my tears and all mankind's bone dry.*

(a long pause)

Neo. *Final your resolution . . .
Then finally – I join you.*

Phil. *Oh noble choice!* (Enter Heracles
Oh nobly reached conclusion! unseen above)

(g) nunc dimittis

Heracles *And you, Achilles' child, my words are for you too;
For neither you alone nor he alone,
Not one without the other, but you both
Shall need each other's strength to conquer Troy.
Like a twin team of hunting lions
You shall guard each others' flanks in friendship.
But bear in mind, when you destroy the land,*

*To honour their gods' altars. Zeus my father
 Rates this above all other things.
 The godly deeds of men do not die with them;
 Come life, come death, they stand for everlasting.*

Phil. *Oh well-beloved voice, I hear you;
 Oh long lost form, my eyes behold you;
 I will not fail to be persuaded.*

Neo. *Nor I, I give my pledge.*

Her. *Then make no long delay.
 The wind and tide await you,
 The impatient sea chafes at your prow. (Exit)*

Phil. *Now at the parting hour,
 My farewell greetings to this land.
 Cave that kept watch with me,
 Nymphs of the springs and meadows,
 Deep bass growl of the headland surge,
 Whence my head was wetted
 Time and again by the south wind's lashes
 As I cowered in my cave,
 And my own tossed cries from the storm within me
 Broke back off Mount Hermaion
 With a groan for answer;
 God-given water-springs,
 I am leaving, I have left already,
 Embarking unbelievably
 On a ship of hope.
 Farewell, you salt-locked shore of Lemnos,
 Bid me good voyage,
 Bear no grudge;
 I whom vast Destiny
 And the sentence of my comrades
 And the unseen infinite force behind events
 Cast here, and claims again
 In the working out of a purpose.*

Chorus *Time now to leave, for all of us,
 First making supplication
 To the Nymphs of the salt ocean
 To grant us safe return.*

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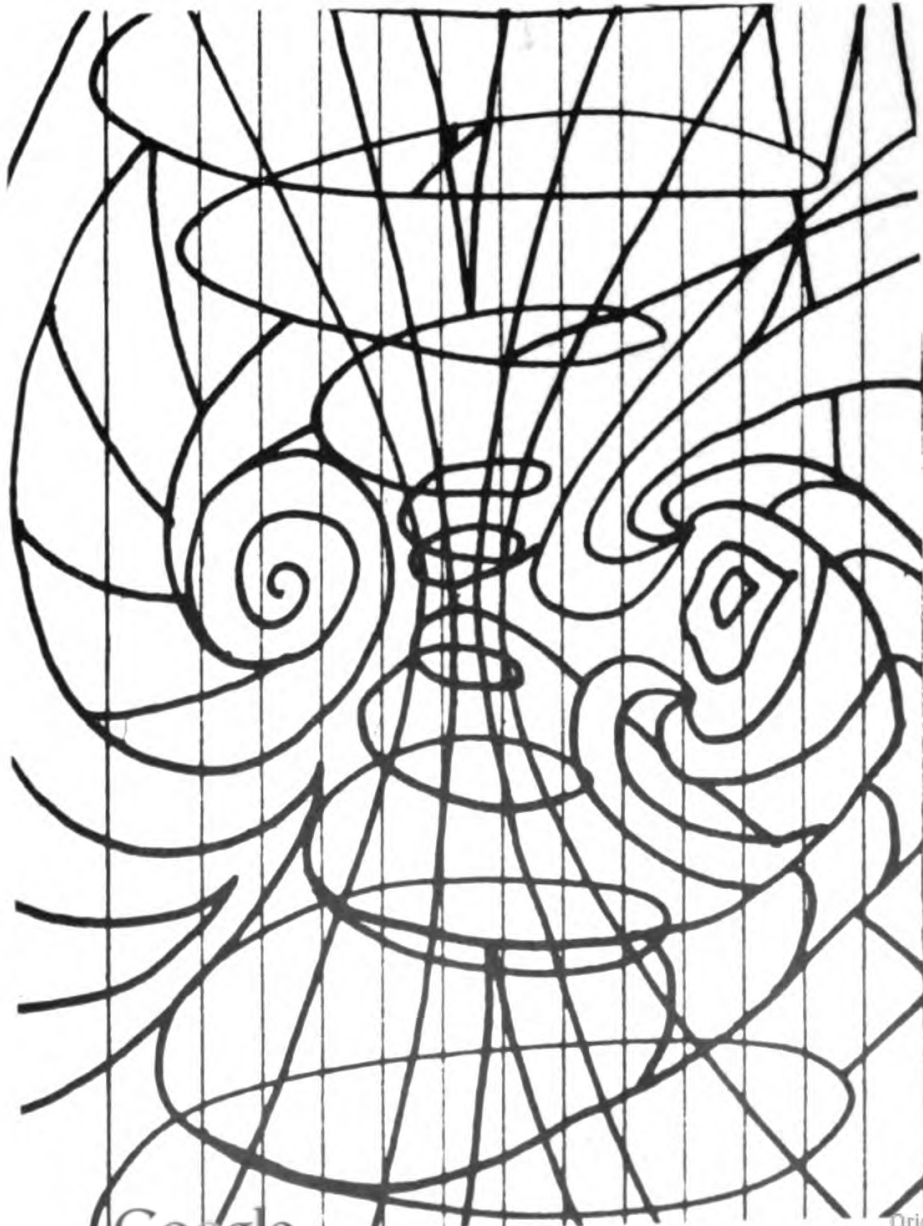
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Editorial

T. to T. is sometimes described as a “science and religion” journal. “And” can stand for a loose assemblage (“shoes and ships and sealing wax . . .”). Some people indeed suggest we are a miscellany. We do however try to have a policy over the kinds of articles we print; for instance, those on environmental questions are under the general rubric of “Technology in the Enhancement of life”. Enhancement can have a religious value, and so indeed, contrary to widespread views, can technology (we shall have more to say about this on other occasions). “And” thus stands here for a stronger connection than just putting science and religion together as things that people do. We want to deepen our understanding of what religion is really like; we want to deepen our understanding of what the world is really like; and we want truth. And we believe that this must come through an enlarged conception of science, in which the metaphysical-religious thrust grows out of the sciences and also feeds back into them.

There is no one party line among the T. to T. group—heaven help us if there were. But we share the conviction that truth is concerned with how things are, and not only with internal consistency within a system, and that where factual claims are made there should be some means of testing them. If this is applied to religious truth, and put as an appeal to religious experience, there is an initial difficulty in saying just what these experiences are in a way which is not already theory laden. People have found the tenets of different denominational educations in what are claimed to be self-authenticating raw data of experience. So it is easy to be cynical and say that all we are left with is a study of the psychology of religious people. What we need, surely, is not only to look at particular religious experiences, facing the difficulties of defining what these are, but to try and see what the properties and powers of the human psycho-biological organism in its environment can indicate about the nature of the real world.

This is, of course, the scientific enterprise, but it is not a highly unified enterprise. There are a number of sciences, and also what we can call proto-sciences, some clearer and firmer than others as to their methods, some having achieved explanatory theories and some not. And the ones which are up against the most awkward kinds of fact, or alleged fact (those most recalcitrant to being fitted

into a materialistic metaphysics) are the least clear about their techniques and the least productive of explanatory theories—depth psychology, for instance, psychobiology, social anthropology, and above all para-psychology. So we are indeed involved in a highly uncomfortable struggle, groping for concepts, groping for hypotheses, groping for means of verification, groping even to see what our sciences are really about and what are the facts that they are trying to interpret. Yet it is in these frontier regions that we come up against happenings which can radically effect our view of what human beings and the world of which they are a part are really like. This is why in T. to T. VI. i we wrote about “The case for way-out research”, and put the need for “revisionary science”. But we are having to think about what revisionary science can be in areas where the sciences are hardly there to revise.

Would this kind of struggle be relevant to whether or not we have a religious view of the world? Some people say, no; it could only show that the world is stranger than we thought. But perhaps the strangeness will be such that we find we need to use if not “spiritual” concepts, some revision of these in order to talk about it. In this morass, where the concepts are not properly charted, and there is no clear division between the metaphysical, the proto-scientific and the scientific, we have to struggle to describe what is happening as well as how to interpret it. This cannot be done just by theorising, if the human animal, and especially the religious animal (as contemplatives have always believed) may itself be a sensitive instrument in discovering what it has to interpret.

This is not the way of looking at religion in the main contemporary academic fashions. One such (less prevalent now perhaps than some years ago) is “Biblical Theology”. This said that the Bible contains revelation, not as verbal inspiration, but as the record of “God’s mighty acts” within a particular chosen people. This, we are told, means interpreting the Biblical history through learning to think about it in Biblical categories, and that these will bring us to see the Old Testament as prophetic preparation for the coming of Christ and the New Testament as the witness to His coming. “Biblical Theology” produced a way in which Biblical theologians could talk to other Biblical theologians, though it was probably very unlike the way the ancient Hebrews really thought. It also cut out the serious study of comparative religion. It made people try to primitivise their thinking in expressions such as “God speaks”, without trying to stand back from these expressions and say what

they might mean because to do so would be to do philosophy, and this is something this method did not want to include. Now it is being more generally recognised that philosophy cannot be avoided. So what of some of the current attempts to do philosophy of religion?

Most of these do it by talking about religious language. There is, for instance, the "ordinary language" way. You take sentences such as "God loves us" and "God created the world" and ask what they mean if they are factual statements as "Jack loves Jill" and "Jack made a boat" are factual statements. Then you come up against the point that in empirical statements it is possible to say what would count against them, whereas it is said that in the cases of the theological statements the believer cannot say that any state of affairs would count against them. He would maintain them whatever the empirical facts, unless he lost his faith, which would happen not because of lack of evidence but because of failure of nerve.

Another way is to try to escape the frustrations produced by this "ordinary language" approach, and say that the expressions must be taken symbolically or analogically. Then the question is how you interpret the symbols or pin down the analogies. These can get further and further from recognizable meaning until they suffer from what Antony Flew called "the death by a thousand qualifications", or fall into what Margaret Masterman (in T. to T. I ii) called "tight corner apophaticising", a progressive whittling away of positive meaning under challenge. Of course there is a great tradition of the *via negativa*. But the masters of this way were not only tight corner apophaticising; they had a great deal that they could tell us positively about the spiritual journey into silence. And in this they used religious language. T. R. Miles, in "Religion and the Scientific Outlook", has a view rather like this, but without the description of the journey, when he defines religion as "silence qualified by parables". But how do we select the parables? Perhaps Zen-wise, as those most likely to lead to this kind of silence (Derek Wright has things to say on this in his article in this number). Or perhaps we select those most likely to encourage us in the ethical policy we have resolved to adopt. But in neither of these cases would it be because they give a picture of the world which is *truer* than others.

To see religion, so far as its intellectual as opposed to its behavioural content is concerned, as a store of stories valued for

ethical reasons is the view of R. B. Braithwaite (himself associated with T. to T.) in his Eddington Lecture, "An Empiricist's view of the Nature of Religious Belief". Stories may or may not be true; their point here is that they can be entertained and reflected on, and doing this can help us to sustain a particular policy for living, for instance what Braithwaite calls the "agapeistic way of life". This removes the difficulties over the truth claims of religious beliefs, enables them to have a meaning, and gives a reason for adopting some parables rather than others. But most of us cannot settle for this reduction to ethics; we are still nagged by the question of whether religious beliefs can make true claims about what the world is like.

There are other philosophers of religion who say that we cannot ask for this kind of reason for religious beliefs, nor indeed for reasons such as that the parables in a religion are morally inspiring or conducive to inner silence, nor indeed give any reasons at all for using certain utterances in a religion other than that they are ingredients in a "language game" that one has opted to play (or finds oneself playing). When we play a game we know the rules which define what moves can and cannot be made in it. This is a view which stems from the later Wittgenstein, and has been called "neo-Wittgensteinian fideism". Its main exponent is D. Z. Phillips. A game is an artificially bounded enterprise which you may or may not engage in. Why should you engage in a particular religious game? Perhaps from causes in your own history; you were born into this religious group, or you liked the company of the people in it, or some impressive person in it put you into a conversion crisis. Some of these ways of getting into the game may have more of an element of choice about them than others, but none of them are *reasons* which could be presented as intellectually convincing to those outside. If you are inside, you can learn from the others inside what moves are proper to make in the language (including the ritual cult in the language). But how can anyone be invited to enter, or begin to learn the game, unless there is also a certain amount of language common to those inside and those out? D. Z. Phillips in a recent paper (in "The Philosophy of Religion", edited by Basil Mitchell, Oxford Readings in Philosophy) sees there is force in this, and he tries to meet it by saying that the religious man shares many experiences with the non-religious (birth, death, pain, for instance) and some of the things he will say about them will coincide with what the non-religious man will also say (that is, presumably

if they are both rational). So, for instance, a religious doctor would not deny that a broken leg was broken. But Phillips will not allow that the facts which they both recognise and can talk about together can provide reasons for the religious man's belief, or that a person's religion might help him to be aware of further facts that might impress the non-religious. So the religious language game is still a closed system, defined by rules internal to itself.

One result of Phillips' own particular form of closed system comes out in what he says about prayer, perhaps the most distinctive of all religious activities. He says that to look, or even hope for results in answer to prayer is superstition, defined as belief in quasi-causal connections, which are non-existent. There is a question here about what is meant by "quasi-causal connections", and how we know that they are non-existent, but we cannot take this one up here. Here our concern is in noting that empirical happenings must be considered to be irrelevant. Incidentally, if part of your language game is trying to be Biblical, this is surely very unBiblical. The Old Testament characters and Jesus Christ in the Gospels certainly seem to have hoped for results when they prayed. They did not only speak as if they were expressing an attitude of devotion (though they did this too), which is all that Phillips says they should be doing.

To define religion in terms of an attitude was R. M. Hare's view when he tried to break out of the verification-falsification impasse by saying that religious utterances expressed "blinks", ways of looking at the world, for instance in a spirit of love and trust, which could colour our interpretations of the facts rather as a paranoid's belief that people are out to persecute him colours his interpretations of the facts. But after all, the paranoid believes that people are in fact out to persecute him, and he is generally wrong. And how do we know that the religious attitude does not produce something like a paranoid delusion perhaps in reverse? So we come back to the question of whether an attitude such as love and trust is justified.

A philosopher who has persistently said that there needs to be a justification for attitudes, that it is not enough just to say they are adopted, and that the justification will be metaphysical and not only ethical, is J. N. Findlay. He has indeed produced a sustained Neo-Hegelian metaphysics (see his "The Transcendence of the Cave" and "Ascent to the Absolute") where the world is seen as a great enterprise of maximising value through overcoming

“diremptions”, the conflicts and tensions consequent on variety. A grand vision; and one can argue with the metaphysical philosophers of religion in a way in which one cannot with the inhabitants of closed systems. Our argument with Findlay would probably be over logic and over his claim to eschew empirical methods. Findlay, however, like Hegel, must have been impressed by the fact that we do experience processes of creative reconciliation. In practice metaphysicians are likely to appeal to illustrations in experience. So we can find common ground.

Those living intellectually in closed systems can often do heroic work—as for instance some fundamentalist medical missions do. Here practical skills and often interest in and love for their fellow men open parts of their minds beyond their system. But if questions are asked about what falls within it, these get recast so that they are answered within its own terms, which means that the point as the questioner saw it will not be met (some stages of work in science are like this, though in the long run the experimental method and the need for imagination give science built-in correctives). Arthur Koestler has described the intellectual atmosphere of life in a closed system (“Arrow in the Blue”, Danube edition p. 309):

“The absence of objectivity in debate is many times compensated by its fervour. The disciple receives a thorough indoctrination, and an equally thorough training in the system’s particular method of reasoning. As a result of this training, he acquires a technique of argumentation which is mostly superior to that of any opponent from outside. He is thoroughly acquainted with the great debates of the past between the apostles and the unbelievers; he is acquainted with the history of heresies and schisms; he knows the classic controversies between Jansenites and Jesuits, between Freud and Jung, between Lenin and Kautsky. Thus he recognises at once the type and attitude of his opponent, is able to classify the latter’s objections according to familiar categories; knows the questions and answers as though they were the opening variants of a chess game. The trained, “closed-minded” theologian, psychologist, or Marxist can at any time make mincemeat of his, “open-minded” adversary and thus prove the superiority of his system to the world and to himself”.

Koestler is writing from his experience inside Communism, but much of what he says would be applicable to closed systems like the “religious language game” which do not claim, like Communism, to be giving universal explanations, but rather are defining a cult. Our reservation to his account is whether in fact nowadays all the inhabitants, even the professionally trained inhabitants, of the religious closed systems are so intellectually sure of themselves, and whether some of them at least know that there are questions being asked from outside about their activity which they cannot answer—indeed they may be asking them themselves. They cannot

settle down in the mutual reassurance of their companions; they can no longer take the rules of the game as providing their own sufficient reason. They want some convincing reasons why they should go on talking the language, including the ritual as part of the language. They are pretty desperate, and will not be helped by the philosophers who tell them that a closed language game is just what a religion must be.

To make our thinking about religion into an open venture of metaphysical proto-science, as we have outlined it, may be to find ourselves in a morass. But there may be ways through a morass. There are no ways out of a closed system except by abandoning the definitions and assumptions which have shut you into it.

Discussion: *The Primal Scream*

(Bernard and Wendy Campbell, George Lyward, Richard Braithwaite, Margaret Masterman, Ted Bastin, Tim Eiloart, Dorothy Emmet)

Tim. We are all interested in primal therapy, which does appear to offer an alternative to psychoanalysis and its derivatives—also in the way primal therapy may be similar to religious direction of a kind which barely exists nowadays, but which, I believe, can happen in private retreats. I know very little about the religious side of things and it seems it may be best to concentrate on the psychoanalytical comparisons initially. The sort of problem which ordinary psycho analysis comes up against is that it rarely cures people—one study showed relief of symptoms in only 27% of cases. People are such, as Eysenck never tires of pointing out, that whenever a study is made of the effect of psycho analysis, patients show no real improvement when compared with a control group receiving no therapy. Janov, the founder of primal therapy, on the other hand, claims to cure a vast majority of his cases (all those that stay with the therapy). He claims to rid of every sort of difficulty, such as alcoholism, drug-taking, homosexuality, epilepsy, ambulatory psychosis, frigidity, and so forth. Bernard and Wendy, I know you have both been into the therapy and started to learn how it is done. Can you tell us some more about it?

Bernard. Primal Therapy could be called an abreaction therapy. Probably the closest thing to it is described by Breuer and Freud in their first (1893) publication. They write that “each individual hysterical symptom immediately and permanently disappeared when we had succeeded in bringing clearly to light the memory of the event by which it was provoked *and in arousing its accompanying affect* (my italics) . . . Recollection without affect almost invariably produces no result”. (From *Studies in Hysteria* by J. Breuer and S. Freud, translated by J. & A. Strachey, London 1956, The Hogarth Press, p. 6). This re-experience of childhood traumata with affect, is described by Arthur Janov, in his book *The Primal Scream* (New York, 1970) as a total psycho-physical experience, and as Freud found, it is therapeutic. Of course we know for sure, and from John Bowlby’s work in particular, that childhood deprivation

can cause neurosis in later life. What Janov has done is to find a technique which helps people feel the pain of childhood traumata without the use of hypnosis (on which Breuer and Freud depended) and without the use of drugs (which the shell-shock doctors such as William Sargent used after world war I). By removing the patient's defences against his painful memories, and by disallowing the patient any diversion from them, Janov has developed a technique which leads to the experience of childhood pain, and which brings it to full consciousness. As Breuer and Freud point out in their early paper, "an injury suffered in silence is a mortification"; That is literally the truth: it seems clear that if pain is not felt at the time it is inflicted, the defence against it is made by disassociation of it from consciousness, which eventually brings the death of the heart and the tyranny of the head.

Dorothy. The psychoanalytic method gets people talking and doesn't now use hypnosis or drugs. How does primal therapy differ from this? I know it is much shorter.

Wendy. The short answer is that primal therapy does it by feeling your feelings instead of talking about them. Primal therapy has something in common with Freud's earliest work but it differs entirely from psychoanalysis as we know it. A patient once described analysis as "being done to", and added "I've been done to all my life—what I need is to experience". In this sense the difference is that the patient plays an active rather than a passive part in his therapy—he travels his own path to the source of his sickness. There is no fixed route, the therapist does not diagnose his condition nor interpret what he says. The patient journeys into his pain and the therapist guides and helps him. The therapist doesn't presume to "know" for the patient; instead he helps him to find out what he already unconsciously "knows".

When feelings are blocked or repressed all that can emerge is some derivative or symbolic substitute. What primal therapy does is to help the patient to feel that blocked feeling instead of discussing and analysing the symbols of it. The reason that it is a shorter route than analysis is that it travels through the feeling to the meaning, enabling the patient to integrate the previously unconscious cause of his pain into his awareness, and so giving him more of himself.

Psychoanalysis aims at developing a healthy defence system

which Freudians believe is necessary in normal life. Janov's view is that there is no such thing as a healthy defence system. Freudians believe that there are certain destructive or aggressive instincts in us which require controlling and consider it dangerous to unleash these forces. In primal therapy we evoke these feelings (which are not instincts), and we aim at shattering the defences and releasing what is repressed. It has been found that when the feeling is really allowed to emerge at last, the patient is flooded with insights into the symbolic behaviour which he has been driven to, all he could afford in the face of being forced to deny his feelings.

Dorothy. Presumably the therapist requires to have been through the therapy.

Wendy. Yes, for a number of reasons. One of the most central is that, having explored the territory of his own deep pain, the therapist is enabled to "be there" for the patient, which means that he can be reassuring and authoritative in the face of the patient's suffering. He can stay calm when the patient's most violent pain comes up because he knows it will be all right, with his feelings, as well as with his head. In other words he can be compassionate instead of anxious. One of the things the therapist frequently says to the patient is: "It's all right—its safe to feel that here".

The second very important reason is that the therapist, having been into his own feelings, has learned to recognise the signs of pain in others, and the presence of its symbols, so that he learns "where the patient is" as we say, and whether he is near enough to specific feelings to be *able* to feel them. He can recognise an inappropriate over-reaction to some event or situation and knows when this indicates a buried lode of primal pain. For example a therapist discovered in the course of a session that the sight of a caged animal was peculiarly upsetting to his patient. He didn't discuss it, interpret it or analyse it in any way: instead he sent the patient to visit the zoo before his next session, since he could see that this excessive reaction symbolised some deep hurt. The patient came in very disturbed, lay down, and let himself feel deeply what it was, instead of talking about it. Afterwards he recognised that his parents had so fenced him in and pressured him that he had felt helpless—*like a caged animal*. This is what we call a connection, when a symbol is traced to its source. Screaming or sobbing—expressing your feelings—can only be genuinely therapeutic if

you go deep enough to make that connection, because the connection is the liberating conclusion to a feeling. That is what a primal is: a feeling followed by a connecting insight.

Dorothy. How in fact does Janov set about bringing the patient to consciousness of his pain?

Wendy. He breaks down his defences in a careful systematic way. In the first three weeks of intensive therapy, he is isolated from everybody except his therapist and asked to avoid every conceivable means of lowering nervous tension. He lives in a motel room by himself, preferably somewhere sleazy and depressing. He must not eat too much (especially if eating is part of his defence); he must not smoke or drink, listen to the radio, watch television, read, make phone calls or masturbate. He is alone with himself and has no escape from his feelings as they begin to rise in him.

Ted. Is he asked not to sleep?

Wendy. People may be asked to stay up all night if their defences are strong, but that suggestion is usually kept until later in the first three weeks. Many people start to crack almost immediately; others, particularly those whose defences are intellectual, may take longer. It is a controlled minor nervous breakdown under the careful and constant supervision of the therapist.

Margaret. Is he being totally taken charge of during those three weeks, in that he knows that, no matter what he does, by night or by day, the protection of the psychoanalyst is still there?

Wendy. Yes: and this total protection has been designed for him to make it safe for him to feel his feelings and to be himself. What the therapy does is to lead you to your pain—as Eliot says, “the way up is the way down”. You go to yourself by going down into yourself.

Richard. I shouldn't agree with this use of the word “pain”. Otherwise everyone here would understand what you are describing, and you don't have to press it.

Bernard. Almost everyone who has read the book has remarked that in a sense it tells us what we knew already. With regard to the terminology, there is a tendency in California to use Anglo-Saxon rather than classical terms. We talk about “pain” and “feeling” rather than “trauma” and “emotion”. This is partly because we are as direct as possible and avoid any intellectual jargon. One main difference between this and anything that might be described as religious, is that the experience relates solely to what is inside the patient and to his relationship with his mother or father or whoever is acting as his parent, and one of the things we find out in primal therapy is that any feelings you may have had relating to God—any projected figure, in fact—turns out to be Mummy or Daddy.

Margaret. That is not one of the things that makes it different; that is one of the things that makes it the same. In what I tend to think of as traditional Sunday School Christianity, as also in many forms of fundamentalist Christianity, projection is indeed identified with some invisible external power or person, the devil, say, or God. But there is another more self-conscious and contemplative form of Christianity, which I will here call “Deep Christianity” where such identifications with invisible powers are by no means made. But neither do I subscribe to your alternative Freudian labelling technique of labelling all such projections “Mummy” or “Daddy”. The nightmare universe contains a lot more nightmares besides mothers and fathers. In my case, for instance, the primal pain of my very early childhood consisted in being first deceived and then asphyxiated before being subjected to surgery when I was two years old; and this was done to me three more times before the age of seven. When I relived my past, by comparison with that ultimate horror, all my good or bad relations with my parents were as nothing. When the doctor who had done the operation died young, when I was seven, I danced round the room, saying “Hooray, Hooray, he’s dead, he’s dead!”

Bernard. Well, let’s say it’s not just parents, but deprivation of the need which every child has for a secure and close relationship with his parents. But I agree absolutely that a trauma can be caused by surgery. I think we need to look much closer at the very deep traumata caused in small children by surgery, and even by less dramatic experiences, such as occur at birth or during circumcision.

Ted. A Christian religious director told me about a woman who had been taken back to a childhood or pre-childhood state, not of course by Janov, and stayed in it for a long time—something like four months. She came out of it thinking she was cured, and, indeed, very enthusiastic about the therapy. In fact however it is his belief that this woman had been caused to *abandon* what he called her *image* of her place in life and at that particular stage of her life, and she had not persisted in the desolation that had come upon her long enough to discover her new, real image, and in response to the therapeutic “forcing” she had assumed a false image. This would be, if true, a terrifying situation because she is not the person she thinks she is. Naturally a great deal depends on this use of the word “Image”. The image is a rough but very deeply felt sense of the function one is playing in one’s life and where it should lead, expressed in terms of and geared into the position one is in at the moment, in particular in relation to other people. The image should be flexible, but if it is stretched out of recognition, then the person loses his driving force and sparkle, and is reduced to acting in a zombic manner. The image does not depend in any way on personification or projection, either with a God figure nor with Mummy and Daddy. On the other hand Janov himself presupposes that there is a liberated personality about which nothing need be said. I would be happier with the progressively changing image which at least acknowledges the mystery, and may suggest directions for investigating it further. Now you may make what you can of this “successive image” picture of the continuing personality, but at any rate that is much more the position of a responsible religious person than the atavistic stuff you were taking as typical of them. This director has this picture of a person’s life as governed by a succession of images which somehow represent the driving force in relation to the particular stage they have reached of a continuing personality. I think this is relevant here because it is a different picture from yours with different consequences for therapy, while yet being thoroughly comparable with it. The director’s view is that at certain points this image goes: it may go gradually or catastrophically. The person may go into a “night of the soul”, or blackness. But then, as he puts it in rather figurative language, it is necessary to “sit by the grave of the image that you lost until another one comes”. He said that occasionally he is forced into the position of pushing people back along the stages of their development, but this was abnormal and dangerous. The

normal development in the Christian tradition as he presents it, is not to write off your past. The process of wiping the slate clean is a very wasteful one.

Bernard. I think that we look upon the question of images rather differently. We see them as aspect of the defence system which people live and act out to stop them feeling these early pains which are carried with them all their life. We simply find that when they re-experience the pain the defence ceases to be necessary. So I think that the real personality—the so-called real self—is there all the time, but walking about with a lot of armour on and as each trauma is re-experienced a piece of armour falls away because it is simply no longer required. What you are left with at the end is just the person who is himself. Image is replaced by reality.

Margaret. I think there is a difficulty here over what you are going to call “the person who is himself”, “the real person”. You on your side see “the real person” as an ideal person, as that “core” or “point of origin” which the ancient Chinese taught was “wholly good”. The real person, for deep Christianity, is made more real and much less ideal; and though every person is assumed by the metaphysics to have potentially a divine principle operating within him, it is not assumed that the total normal person, as he actually is and lives and operates, is wholly good. “All right”, you say, “but what prevents him from being wholly good is all these neurotic defence-patterns, all this armature which he has acquired through his being subjected to, and not being able to bear, the Primal Pain in very early childhood. But for deep Christianity, the Primal Pain can continue, in the sense that it can be triggered off by things that happen far later than in early childhood. The novelist Arthur Koestler calls it “Ahor: Anonymous Horror”. The process of defence making continues all through life, and whenever such a defence is broken open, Primal Pain will set in. And some causes of “Ahor” may be irremovable. My chief criticism of the first Janov book was that it ought to have had four more chapters: one on incurable illness, one on bereavement, one on unjust condemnation, and one on death. Unless there is some deep process of rebuilding and developing some “real self” or the self by grace, or the deep self, or whatever you call it, so that it ultimately becomes strong enough to meet the shocks and “Ahors” not only which have come in early childhood, but which are still coming and will come

in the future, it does not seem to me that you have a complete therapy. St. Augustine said "Do not grow old in grace, but let that which has grown young within you grow".

Bernard. I think it is true that in primal therapy the breakdown precedes and is accompanied by a rebuilding process. But we place little emphasis on rebuilding. The most life-giving development which accompanies the breakdown is the casting away of complex arrays of defences—struggles which consume precious time and energy, and indeed important aspects of the patients' total life style. Life is, in a very real sense, simplified, and this simplification comes with immense relief. Suddenly it is no longer necessary to do so many things we did before, usually things done to get love from others—love which, if we do get it, will never satisfy that aching void. With the void felt and known for the first time, there is no need to struggle for love. Janov once defined love as a "word invented by neurotics for what they never had". And this is certainly an important aspect of it. No longer needing it, we are free to give it; and loving, Janov says, is *letting others be themselves*.

The word "rebuilding" for us can really only be used to describe our coming to terms with the sick society in which we live. Primal therapy simply brings together the dissociated parts of ourselves and makes us whole people. Though he only glimpsed it, Matthew Arnold has expressed what I have been trying to say beautifully in

The Buried Life.

And there arrives a lull in the hot race
Wherein he does forever chase
That flying and elusive shadow, rest.
The air of coolness plays upon his face,
And an unwonted calm pervades his breast.
And then he thinks he knows
The hills where his life rose,
And the sea where it goes.

Dorothy. What about these hills? Are they early childhood? If so, what sort of a picture does Janov have of this? Does he think small children have no initiative, or that there can be choices on the child's side as well as the parents? Is the child always the victim, or can it sometimes be something of a little monster as well?

Wendy. Absolutely not, unless you have made it a monster.

Dorothy. There is a child-worship currently going on. And this is not to say that children aren't marvellous.

Wendy. A child is helpless and at the mercy of the big people around him, upon whom he depends for everything he has. If he is hurt, he may react in unattractive ways. He is hardly in a position to rise above it.

Dorothy. I'm not sure that children are always so helpless. They have their own ways of exercising pressure.

Wendy. That's what I mean. A child is distressed, and he exercises pressure, as you put it; nothing else is open to him.

Bernard. Let me give you a precise example. When the child is born it carries some innate responses, one of which is to cry. This is a signal that the child needs to be picked up and held, or to be fed, and if the parents don't respond to that cry and leave the child crying, the child will suffer some deprivation of its needs.

Richard. I myself think one of the troubles is all this emphasis on the word "deprivation". That's why I, in the much older straightforward Freudian tradition, think that Freud's language about the "reality principle" is really much more helpful. I mean, the child at a certain moment in its training has to face the fact that it is not going to get what it wants. If you say that this is "deprivation", then deprivation goes on the whole time. *We* are probably being deprived at the present minute. We are none of us exactly doing the things we should like to do. Are we all deprived at the present moment? I think the use of this word "deprivation" is an entire obfuscation of clear thinking about education.

Tim. What has a child got to be deprived of before the age of five? I mean, if you look at certain very primitive tribes (and at monkeys) you see that the child is with one parent or the other every hour of every day of its life up till then. This is not the case in Western civilisation, but I certainly don't see why it has not to be the case. What are the things that child must learn to "face" by the age of five?

Richard. He must learn patience. Children will learn that at quite an early age. I was looking after my grandson who is two

months old a little time ago. He sometimes started crying. This wasn't very serious. You left him. I did not take to hugging him, embracing him, lying on the sofa and tickling his toes, the proper things, until he had cried for quite a while, until it was quite clearly beyond his ability to cope with his crying. But he was quite good at coping, when he found he wasn't replied to immediately, and then going quiet again. There are peoples where which the baby is put on the mother's back and remains there, in close contact with the mother. That's all right. But the mother does absolutely nothing with the baby while it's there. The mother goes about the market or whatever.

Wendy. But it is in close contact with its mother. The contact is most important.

Dorothy. But take extreme cases of people where there is a crisis situation, for instance they are under attack from raiders. Women may be just about to nurse a child, when the parent gets killed. Yet the children succeed in getting over the situation. Even a child that had lost a parent and then lost a foster parent, appears to be able to grow up all right.

Margaret. There are accounts of a Red Indian tribe where the child is with one parent or another day or night, and they adore children. But they live daily in a situation of danger. From birth as soon as that child tried to cry its nose was held, and after a very short time the child ceased crying. They simply couldn't afford to let it cry in case their enemies found them and killed them.

Wendy. We are not concerned with mere survival but with neurosis.

Ted. The Nigerians will not have their children cry. They say, "Sit down y'bloody fool". That's the universal remark to a child, who's already lying on its back.

Wendy. You can do a great many things to children and get certain results. It's not a question to us of what *can* be done to train a child in a certain way. It's a question of what happens to the child when certain things are done to it, when it doesn't get certain things. To discuss what you can do and what a child ought to be,

and how it ought to behave is to us quite irrelevant. Different societies train children in different ways to achieve different ends. Of course children can “learn” patience as they can learn anything else. As primal therapists we are not concerned with deprivation in any general sense but with deprivation in early childhood and by this we mean the failure on the part of the parent to satisfy the primary biological needs of the child for skin-to-skin contact, warmth, nourishment, comfort and stimulus. Precisely in so far as these needs are satisfied, so are they outgrown. Precisely in so far as they remain unsatisfied, so does the child defend against them by the involuntary blocking of his feeling, his consciousness of his unmet need. In the face of deprivation children “shut down”, and may eventually become schizophrenic. This is the genesis of neurosis.

Bernard. A child can learn in the human way when it can understand, and it can learn patience when it can understand the need for it. If an infant stops expressing its need (when the need is not satisfied), it has not “learned” patience, but rather it has learned not to feel the need, and this, as Freud might have said, is literally mortifying; the beginning of a slow death. That is our uncompromising position.

Margaret. It isn't the early Janov. I was interested to see in the early book that Janov didn't suppose that all parents were neurotic, which is a tendency that Freud had. Nor did he think that every action of the parent (every deprivation)—was going to cause the primal pain or the primal scene.

Dorothy. Deprivations, and even mishaps such as being back late or having to leave the child in hospital, can be survived provided the parent's relationship with the child is a living one and the parent is not tending rather to wish to regress himself. Normal parents can have normal children. Neurotic parents repeat the pattern.

Margaret. A woman called P. M. Pickard wrote a book “I could a tale unfold”. She has this feeling about children in an absolutely extreme form. No parent could fail to be full of guilt and angst.

Wendy. More parents *ought* to be full of guilt and angst. They are just unaware of what they have done to their children.

Dorothy. If you make people so that they can't see their parents any more because they remember too much, you'll have a set of hurt and probably in their turn neurotic parents.

Wendy. This isn't really what happens. You come in defending your parents hotly and feeling that you couldn't bear to criticize them; but then when you are broken down and really get into your deeper feelings and your defences fall apart, things change. I discovered that I had wanted to kill my father all my life, and I went through months and months of that I wanted to kill him—strangle him, and other things that I had never dared to admit to myself in any way—on a conscious level. But now having been through all that, I feel a pity for my father and an acceptance of things that I could never have felt before because I can see how terrible his life was—how he was a victim in his turn. It has given me a tenderness and a sympathy I could never have had any other way.

Bernard. Let me tell how I look upon neurosis. It is one of *Homo sapiens'* adaptations for survival. His ability to go neurotic is highly adaptive and absolutely invaluable. It's a characteristic of all people. It's self-protective and it allows human beings to survive. In the present world, people resort more to neurosis than they would under less stressful conditions. When it gets so bad that you cannot survive in society then you go for help, and call yourself neurotic.

Tim. Also you cannot survive with yourself.

Margaret. Do you think, in fact, that there is a non-neurotic person?

Bernard. Given that the possibility of becoming neurotic exists as a species-specific character of man—as a refuge from stress—it seems to me likely that most people will come to use that refuge in some degree. I prefer not to use the concept non-neurotic. Some people are more real than others, and by that I mean that they have less armour—a less highly developed defence system. They go psychologically more naked and they are the most attractive people

among us. This is what we call being "straight". Again, Matthew Arnold put it well when he wrote:

the heart lies plain,
and what we mean we say, and what we would we know.

Margaret. That is terribly Christian. I used to kick at the Christians, the deep Christians, for saying the equivalent of "there is no non-neurotic person". I used to say, "Are you sure?"

Wendy. I think that's quite true. I don't believe there are any people who are not neurotic in some degree.

Tim. George Lyward here is wanting to know why neurotic should be a perjorative term anyway.

Richard. It isn't a question of *perjorative*. The point is is it a descriptive term?

George. The thing that strikes me most is this word pain. I'm never tired of using the word pain. I'm concerned with the mystery of pain. Much as death is a mystery, I would have thought that most recent work on neuro-physiology shows that the brain registered pain long before it registers anything else. Pleasure, in a sense, is to start with, only an alleviation of pain. Therefore, the fundamental thing is pain which we can't understand. I said in a talk a fortnight ago that I would like social workers to be dedicated to pain. But I also mean I want them to be dedicated to joy as well as pain. To love in its creative or ecstatic mode. I have had a good deal of experience of abreaction. I don't ever come to conclusions, but if I had I would have come to the conclusion that abreaction is not the same thing as continuing to live creatively. You can have an abreaction which is very painful and sometimes very prolonged; I've had certain abreactions of that kind and I've seen other people have them. That in itself never seems to me to prefigure the discovery, or the realisation of what I would prefer to call the elusive self. I get people sent to me and they say "he wants to find himself". I never promise him he can find himself. Does he ever find himself? Isn't this always elusive? In other words. I'm tremendously sympathetic to this question of pain because I feel its absolutely fundamental. My work I feel is really helping people to cope, each of

them, with whatever happens to him, but I couldn't subscribe easily to the view that abreaction is by any means so deeply significant, though I do feel it plays a tremendous part. I've got a boy who used to drink a lot. I used to get at him humourously. I used to say "Come on you old drunken hound". I started to talk about objects in space. How everybody emphasises the *time* aspect of our subjective experience, and he became very interested, and the next day he came for more. But instead of giving him more, I said to him "Will you shake me by the hand?" and he couldn't. Gradually I shook him hard by the hand, gripped his hand, and then he began to grip mine more firmly, and gradually down came the tears. Floods and floods of tears. When there was a slight pause I said to him (I didn't know anything about Janov) "Daddy or Mummy?" He said "Daddy, Daddy" and I said to him "Well call out for Daddy" and he called out for Daddy. This went on for about an hour. After which he fell to sleep. When he woke up I said to him "What is it all about?" and he said "My father and I have never been able to speak to each other since I was five. We are both so shy". This is the pain. And we talked a lot about it. And I let him go back to Switzerland. He is an American boy. His father is a high-powered business man. And they rang up and said "I'm afraid he is not getting on much better with his father. He is still slipping away with his drug-taking friends". And he came back to England and was arrested on the way through London with drugs on him and taken to a remand home. They allowed him to come down for a day to me. He came down with his father. I said to the father, "Do you love this boy?" It was quite obvious that he did, and that he had suffered as much as the boy from this shyness. I said to his father "Are you going to stay in London to see him through his court case?" He said "No, no I must get back to my business". Then I allowed myself to be human, if you know what I mean, I was very angry, and I said "What the bloody hell do you mean by telling me that you love this boy and won't stay in London and see him through his court case?" I allowed myself to go on; it was the one time I was glad I was older than the other chap and I let fly at him for ten minutes. And he suddenly burst into tears. Then I went out and fetched the boy and left them together. When I came back they had their arms round each other, both in tears. And the man then said "Can I have lunch with the boys?" He sat next to one of the boys and immediately said to the boy "Your boss didn't half let into me, mate. Made me cry" in the most simple

way you can imagine. From that moment their relation has been different. The boy, instead of claiming that he wanted to walk round the world, left me two days ago to go back to America. You see, I rather have sympathy for this question of crying out in pain, although I knew nothing about Janov. It was just a part of my work which came along almost casually as part of a group life, which is of very great depth and very fluid, and, I hope, loving, not in a judicial sense but in a deeper estatic mode.

Margaret. You were fortunate in being able to pitch into the father. But imagine Janov's position He can only deal with one side, and the parent may in fact be dead (he deals with adults) and in a case like this, he would have to have dealt with the boy and then sent the boy home to cope with his dad.

Ted. I have an uncomfortable feeling that, whatever was wrong with me, you would shove it on to a parent. I'm not denying that a powerful healing person might help me through my trouble by putting me in a sort of framework of its being "done" by somebody, perhaps not a father. But nevertheless an intellectual straightjacket would be put on it.

Tim. But Ted, that's the totally opposite thing. You do it to yourself. If you end up blaming your parents nobody has asked you to do that.

Ted. So you say. But do I believe you?

Bernard. The critical thing is how the child felt at certain times in its life not what was "done" to it. The traumatic experiences might have been because the mother was gossiping on the telephone for two hours and didn't attend to the child, it might have been a motor accident, it might have been a wartime experience. It might have been one of a hundred-and-one things, many of which were nothing to do with the parents. But to feel the feeling of "I need" which was not felt at the time, when the need was not met is therapeutic. This is the critical thing.

Ted. Well, suppose I came to you and said, I've been thinking about eternity and space and in Pascal's words "the eternal silence of these infinite spaces terrify me". You would have said to me,

“Yes, yes, dear, now who has been hurting you, dear?” And I would have finished up presenting my fear in terms of somebody who had been hurting me.

Wendy. No. We would say, “Feel it”.

Bernard Are you an adult coming as a patient, or are you really a child?

Ted. I’m trying to imagine myself as I was when I was a five year old child.

Bernard. That problem sounds like a symbol of pain.

Richard. It’s the notion that it’s your parents who maltreat you that I object to.

Wendy. Yes, We don’t specify who did it. Nobody suggests that anyone sets out to ill-treat- a child. It’s simply that things happen and when they happen they give rise to certain feelings in children. Some of these feelings when not expressed at the time are very harmful to the child.

Richard. I beg your pardon. They are expressed. When I was young, the trouble was I was bullied at school. The people I regarded as the menace—the devils—were other children a bit older than me. I did not actually resent my parents for sending me into this situation because I think putting it on to parents is wrong. I think I was a little realistic. It would probably have happened anywhere. I was sent to boarding school a little young, I think. It’s reality. It’s other people.

Ted. I was wanting to generalise, and say maybe it isn’t people at all.

Richard. Yes, it may be also metaphysical, I think, but this is slightly different.

Bernard. As I said before, its not the people who hurt you, but the feelings of hurt which you suffered, which we are interested in. You are using reason here as a defence against feeling: the impor-

tant thing is that *you felt hurt*. This is where the therapy begins. It also follows that blame is irrelevant: there is no blame, neither is there justification. To blame another and justify oneself is in fact part of the struggle to be loved which I have referred to earlier.

Margaret. I think that if you are going to initiate other people or to practice any deep or lifelong primal therapeutic development—that is, if you are going to teach a method of what could be called “Primal Living”, which may start with primal therapy but which then becomes a permanent way of life—that other sorts of “primals” have got to come in besides those in which the patient relives, or “uprushes”, the immediate experiences of his early childhood. There are metaphysical primals, and there are, even more inexplicably, what might be called “parapsychological primals”. I started worrying about eternity when I was five, and my brother, at about the same age, said, “I am not afraid of the dark, but of the things in it”. If you concede, as Jung does, that the human personality might be an open-ended system, not each personality a closed system with a separate shell round it, then a great many more things might uprush within it, or through it, than the relived experiences of very early childhood.

George. My most seriously delinquent boy said to me, “I can’t go to sleep”, and I said, “Why?”, and he said, “Because I am so afraid of waking up and finding I am the only person in the world”.

Bernard. We haven’t found it necessary to postulate any parapsychological goings on because we find that these creatures in the dark you describe are only projections of what you call feelings. You let the creatures be there, and the patient is told, “It’s all right, these are only feelings”.

Dorothy. Then you do make an interpretation.

Wendy. The consequence is they then have a primal cry, and they are liberated from it. It frequently happens that somebody who is on the verge of being psychotic starts to hallucinate at the beginning of a session. We recently had experience of several such patients, one of whom hallucinated snakes in the corner of the

room, and the only thing you can do is to reassure them by telling them *what the snake is*—that it is the sign or symbol of a feeling which is too painful to feel at that time. (No attempt is made to interpret the symbol beyond that point).

Ted. I had a friend who began hallucinating at the National Physical Laboratory, and he was in danger of losing his job. He saw patterns of loops, and he said, “They’re coming at me, they’re coming at me”, and I said “That doesn’t matter, but what is the pattern of the loops?”. When he told us what the pattern was, I said, “Surely that is a familiar cybernetic concept?”, and this seemed to relieve him.

Margaret. If you say, “What comes up in such an uprush is all feelings”, you don’t allow for the creative elements. In World War II, at a time when I was very overworked, I had an uprush of automatic writing. I was very ashamed of this, as it kept happening, but at last I brought myself to tell Richard about it. He said, “Let me see what you have written”. I said, “But it was not normal writing, it was automatic writing”. He said, “I couldn’t care less *how* you’ve written it. What I want to know is *what* you’ve written. Is it sensible?” So he read it and said, “You know, I think you have got something there”; and I made the content of it into a scientific paper, and it later got a scientific award. When the man in the National Physical Laboratory had disentangled his feelings he could do his research.

Wendy. But that’s not at all surprising. That makes very good sense.

Margaret. The point is he would rather have had the loops, hallucinations even, however frightening, than not have got his cybernetic pattern.

Wendy. My patient wouldn’t have. He didn’t like the snakes and was very frightened.

Bernard. You don’t have to come into therapy. Lots of neurotics have quite nice kinds of neurosis which they enjoy. This is not a therapy for people who value the manifestations of sickness—as many do.

Margaret. But the cybernetic pattern which was obtained was highly interesting.

Dorothy. And that is what really matters.

Wendy. But I thought this meeting was to do with people's pain and their illness and how to deal with it, which is to feel it, get rid of the neurotic patterns that are needed to keep it buried, and thus enable people to live their lives with understanding.

Margaret. They are going to go on getting a lot more pain.

Bernard. Therapy doesn't take away the pain but it takes away the need to act non-adaptively; assuming the people who come in find their behaviour constitutes a problem.

George. Are you saying this is brought about by a specific abreaction at a specific time?

Wendy. No. It's a whole series of abreactions, a hundred, two hundred, three hundred.

George. So it can go on and on?

Wendy. Yes. I shall be having primals for the rest of my life. Whenever something occurs that evokes a response out of proportion to the stimulus.

Richard. But this is all cutting things up. The language about finding yourself and integrating your personality is the language that speaks to my condition always.

Margaret. Yes, but I think we shall underate the achievement of Janov, if we talk only about "finding ourselves" or "integrating our personalities"; because to talk only like this is, I think, to minimise the difference in level of depth between Janov's primal therapy, and the usual current forms of "insight psychiatry". Janov seems to me to have stressed the therapeutic necessity and centrality of three excellent things. Firstly, he isn't afraid to compel his patients to undergo a sequence of quite severe ascetic deprivations—solitude, silence, sleeplessness, fasting—in order to assist them

wholly and completely to loosen up; and he offers them this total protection while they are doing this. Secondly, he will not compromise on the necessity of experiencing true "primals". Thirdly, he is prepared, at no matter what cost, to let everything happen. This is a therapy where all the horrors are faced; except possibly right towards the end, there is from first to last, no false "sweetness and light".

It is perhaps because of these three characteristics of this new-old Janov therapy that I feel the need to compare and contrast it with the whole more inclusive process of training and development in what I think of as "deep Christianity". For not only do I think that Janov's three excellences would test out the depth of "deep Christianity" i.e. would test whether any particular alleged form of "deep Christianity" was really deep. I also think that the fact that deep Christian development tends towards a final goal, whereas primal therapy only ends you up in a single desirable state, is something which primal therapists need to know, and never will know, because the traditional Christian symbolism and cult now hide just that which they were originally constructed to illuminate, namely, the "deep Christian shape" underneath.

Bernard. Can you describe this?

Margaret. I just don't know how to start. If I say that deep traditional Christianity knew about and could distinguish five kinds of tears: and corresponding to these, five levels of trembling and sweat, most Christian people who read this will either disbelieve me or be horrified: but you will, from your own experience, give credence to what I say. This is only one detail: of course, there are more.

If I must be short and general, what I want to say about "deep Christianity" comes down to two points. Firstly, in deep Christian training, though the man or woman undergoing the training, is, over a period, indeed "opened right up", from the first something new ("the new man") is being built up in him as well as something else ("the old man") dissolved and broken down: so that, however deeply infused ("infused" is the Christian word which is nearest to "primal") any particular spontaneous experience of "breaking down" or "reliving" may be, there is always this growing new element within him which the Christian contemplative can cling to.

The second point which I want to make is that deep Christian contemplative development especially in the very early centuries, was always thought of as having three infused stages (Purgative, Illuminative, Unitive) not just one; though differing traditions, in different centuries, made the cuts between the three stages at differing points, and modern “activist” Christianity (how unlike Janov) rejects the notion of any infused experiences at all. In the first stage, “infused opening up” and total purgation occurred—the object being to achieve a very deep self-knowledge. In the second stage (which was the most dangerous stage) the contemplative was unstable: sometimes the infused and growing “new man” had charge of him and dictated an altogether new and blessed pattern of behaviour: sometimes his personality seemed to split and he had horrific primals and seemed to himself to regress to behaviour even worse than before he had ever embarked on “the Purgative Way”. A late 15th century Benedictine teacher of contemplation, Augustine Baker, described this state as one of “having one foot on earth and one in heaven”; and as being both dangerous in itself and also as requiring very great and strenuous effort to ensure that “the foot in heaven” should in the end pull up the foot which was left on earth—as opposed to the “foot on earth” disastrously dragging down the foot which had been in heaven. But the final state, the “Unitive State” was both “heavenly” (blessed if you like) and stable. From then on there were no more “primals”, since a continuous, infused, high kind of “primal life” had permanently and unshakeably set in: accompanied by transmittable joy, absence of fear, a fundamental “tonic tenderness” love and compassion, and, at need, what one writer described as “the terrible strength” of the saints.

Now, primal therapy could be held to explore the first, (and I do not know of any other contemporary therapy which does this, to the same extent anyway) and, in part, the second of these three stages. But it betrays no inkling of being ever aware of the existence of the third, the attainment of which is the whole goal, the whole point, if you like, of the whole process and shape of the deep Christian enterprise.

Tim. I do not see the similarity between contemplation and primals. Furthermore, I think there’s quite a lot of evidence that contemplation is a matter of forced alpha-rhythm driving, which is quite contrary to primal theory. I think it would be very easy to

fudge over these two and say they are similar, when they may be very different. If there is a lot of evidence, I would love to hear about it.

Margaret. I have been trying to talk inclusively about the whole trend of what I have called “deep Christian” training and development: not just alpha-rhythm establishment by contemplation.

Ted. I want to mention athleticism. Both the primal experience and the other methods of spiritual training that have been compared with it involve physical violence, and physical violence is part of the athlete’s stock-in-trade. Sometimes the violence in the spiritual training is a by-product of the sudden détente which returns the patient/penitent to his real self—the screaming is violent in this way—and sometimes violence is used to bring on the détente. I would class some of the restraints imposed on primal therapy as violent, but much clearer cases are to be found in other kinds of spiritual training where all sorts of exacting bodily posture (yoga), cold showers (public schools) and sometimes beating are used to wake the person up fundamentally.

The athlete sees this—if he is at all articulate—from a different point of view. He has some aim in view which requires the greatest muscular co-ordination of which he is capable. He usually requires a warming up period to reach a state where he is capable of this (though the more professional he is the less warming up he tends to need; the immature athlete needs to work himself into an ecstasy before his actions—tennis shots, say—are good). It seems that a sleepy torpor has to be broken through as you will often find with a rowing crew who need a good severe physical shock to begin to be at their best. This explains the phenomenon of the “second wind”, when the rigours of a race constitute the physical shock. They have mounted to a pitch where the crew’s fears of letting go suddenly become irrelevant.

I think that in this sphere of athletics—even though it can only be a very partial example—a false personality builds up which is responsible for the athlete being below his best till he has destroyed it. And it is *far* harder to destroy it where the activity is not one where there is action (as in a race which one can throw oneself violently into). I do not think it follows at all that there is a simple dichotomy between a single false personality and a single real one in the athletic context, let alone in more general contexts. In par-

ticular in the subtler skills there seems scope for progression through many stages of mastery.

Now this knowledge of what happens in athletics is partly what makes me a bit dissatisfied with the Janov idea of *reliving* an experience. I want to know its relation to the creation and destruction of these false personalities. What I suspect is that the “primal pain” is only one of many excuses that the true personality may have for *failing* to overcome them.

Tim. Yes but have you in fact had the experience of reliving primal pain?

Ted. In asking that you are presupposing the whole Janov theory. I was trying to counter with a position which would say that in the contemplative theory those events that it is necessary to relive you will relive, to the extent that it is necessary to do so. It is another theoretic position on the subject.

Richard. The question is that of the importance of reliving again early experience.

Margaret. I think the question is between a therapy like Janov’s that in a way forces it on, but I don’t hold that Janov did force it on. It’s a question of doing things to people to get this to happen.

Tim. But Ted said that contemplation would produce the “necessary” amount of reliving and so forth, and I want to know if he is prepared to talk any further about this, or whether he wants me to take it on trust.

Bernard. I don’t personally like the word “reliving”. I think it’s better to say “re-experiencing”. You don’t really relive; what you do is to feel some (not all) of the painful feelings that the little child felt, so it’s not really a reliving, though we believe the body does sometimes do things that it did at the time.

Wendy. The point is to bring the feeling out. We haven’t made quite clear that if you don’t “make connections” after primals, then no matter how many you have you will not bring the pain into consciousness. If you have a primal you have an upsurge of early feeling and you express it, and you very seldom have a primal

from which you could not instantly remove yourself. You can come out of it just like that. It's not a condition over which you have no control. It is not a seizure or an attack, or anything like that. One patient described it as conscious-coma.

Bernard. We find that a particular traumatic experience in childhood has resulted in a particular type of acting out or defence, and after having the primal the patient connects the two together. The defence might be a certain posture, a tone of voice, exposing oneself or whatever. The patient comes out of the primal (not every primal but the ones that reach to the core of the pain) and exclaims, "That's why, that's why . . .", and it is very very important that the patient is left quite still to make the connection between trauma and defence at this time. You make the connection and then it is no longer necessary to continue to act out. You don't immediately stop doing it but it is no longer needed, and in time it dies away.

Margaret. Can you in fact fall back?

Bernard. Yes, indeed. This foot in heaven, foot on earth business seems to me very familiar.

Wendy. Sometimes it does happen that a defence mechanism stops suddenly, but for the most part a habit or an attitude drops off slowly. You make more connections more deeply each time you have a primal about that particular thing.

Bernard. Exactly. The problem arises from the existence of a defence, and a common defence for people like ourselves is continuous intellectual activity. I realise now that ever since I became passionately interested in making radio sets at the age of 12 or 13, I have been happiest when I have been fully absorbed in my head. The defence of intellectuality is one of the most difficult to crack in the therapy. But I found one weak link in my defence: music. This is the language of emotion, of feeling, and this was the key to my own buried life.

Margaret. So it's a connection between a pattern of behaviour and the uprush so to speak?

Wendy. Precisely.

George. It does seem to me that this is too psychological. You do seem concerned with the categories of cause and effect too exclusively. What concerns me is whether we are reducing the meaning of life, reducing it to being a commentary on what happened to you when you were a child.

Wendy. Certainly not.

Margaret. It's the insight therapists of the Freudian kind who tend to do this. They say, "Don't want any of the things you did want. Want what you can get".

Richard. "Adapt yourself to society".

Margaret. "Lower your sights". Now both Janov and deep Christianity say, "My God, no, aim for the moon and get it".

Wendy. Exactly.

Margaret. Love God, and do what you like.

Dorothy. And what do you want, George?

George. Revelation. I do think this can be tied up with what I'm trying to say about love and power. Therapy can so easily be the operation of power. The atmosphere of love is so important. What, for instance, is the relationship between the therapist and the patient?

Wendy. One of total acceptance.

Margaret. It is a terrific thing. It's not just acceptance of the patient, without ever manipulating the patient or trying to shape the patient; Janov did try frightfully hard not to do this. But it means being available day and night (until they become almost one person . . .).

George. My present problem is that I have to do with some psychopaths, who are frozen people. They have no guilt, no feeling,

no relationship except to use you. Can Janov's therapy help with people like this?

Bernard. I believe primal therapy would be appropriate to people like this, but a more intensive course would be required. This has not yet been tried, as far as I know, but it is a challenge.

You mentioned revelation, George. For me, revelation is the experience of seeing the truth, which may indeed be concerned with cause and effect. Pascal wrote that the heart has its reasons which reason cannot know. Primal therapy reveals to us the reasons of the heart and this is the greatest revelation which man can experience. Don't think I underestimate man's potential. While some may believe that man can reach out to God, I believe quite simply that man is God and should come to know this. The revelation to man of his whole nature is no mean achievement; it is the whole glory of human life.

Dorothy. I should like to know what George means by "revelation".

George. That in an atmosphere of complete love something new will appear out of a relationship, and guide it in a new direction.

Cans't thou not Minister to a mind Diseas'd?

Mary Glover

The purpose of this article is to compare the ministry to diseased minds offered at the Retreat at York from 1796, with what is going on today. This is, of course, difficult, because today's methods are changing so fast and also because there are great differences between one mental hospital and another. I have not touched on the problem of geriatrics, nor upon mental defect.

I

As I said in my first article, the Quakers at the Retreat soon broke away from the established methods of their day in handling the insane; these were based on fear, as the foundation for control and good order, and dehydration as a physical treatment, supposed to remedy the condition. They worked out an experimental method of their own, which they called moral treatment. This rested on the principle that reason in the insane is not destroyed but impaired, that patients can respond to an appeal to their rationality and their affections, and that progress and comfort depend on the restoration of their self-confidence. The Quakers invented occupational therapy; in their first Report it is emphasized that work is very beneficial; and they also welcomed visitors and contact with the outside world. *The Description of the Retreat*, published in 1813, and re-published in 1964 by Dawsons of Pall Mall, gives a general account of the first 15 years, and records the refinements of personal kindness worked out by the superintendent George Jepson and his wife, Katherine.

The Retreat won wide publicity and a limited number of asylums in this country adopted its methods. Meanwhile on the continent similar ideas spread from the Bicêtre in France, where Pinel had been simultaneously at work on the same principles. The two institutions did not for some years know of each other's work, because of the war with France. The idea of moral treatment caught on and spread widely. An advance on the methods of the Retreat was achieved not long after the publication of the Description; Sam Tuke and George Jepson had believed that it would never be pos-

sible entirely to eliminate coercion as a last resort; but all physical means of restraint were abolished at Lincoln Asylum in 1837, and by the middle of the century the old forcible methods had gone out of use generally. In the latter part of the 19th century the ideal of moral treatment faded out and the concept of custodial care took its place as the norm. Today the basic principles of the Retreat are widely accepted—respect for the patient as an individual and attention to him, reasonable work, as much freedom as possible.

In the fields of work and of recreation the modern hospital goes further than the Retreat was able to go, calling on a wide variety of skills and much help from the outside community.

The Retreat provided those patients, who could in some degree cope with it, with work that was needed to sustain the institution, sewing and knitting for the women (there was then no industry mass-producing cheap clothing) and basket-making and outdoor labour for the men. These jobs were done alongside the sane, and were the normal kind of work that everybody did, and, therefore, commanded respect; they called for homely skills that patients would have already. The modern hospital often concentrates on arts and crafts as the main part of the work programme, and these provide occupations which have not got a wide appeal, and demand special skills that require patience and application which the insane find it difficult to give. Other hospitals get industrial contract work through the co-operation of some firms. Processes going on inside the factory are studied to isolate tasks which are within the competence of the insane at various levels; the materials and equipment for them are transported to the hospital, the work is done and transported back again. The factory pays for the work done at the market rate, and this payment has to cover packing and transport, and the clerical work, in order to reckon payment due. The individual, therefore, does not get a high wage; but he is doing the same sort of work as the sane in the world at large and, like the sane, he is pleased to have money. Some of this work is, of course, terribly monotonous and boring, but, pathetically, precisely this fact brings it within the competence of some patients. Only a few factories will take the trouble to co-operate in this way for the sake of “a loony-bin”.

In the field of recreation the Retreat, because it was run by Quakers, made no use of music or painting or novels or dancing. Its patients being Quakers would not have expected any of these diversions. The modern hospital has no such inhibitions, and the

occupational therapist is a highly trained professional and devises an enormous range of activities and amusements. The community at large makes a contribution; people come into the asylum to help with classes, lectures, plays, games and so on. A striking feature of some hospitals is the help given by teenagers; they assist in the occupational therapy department, talk to patients, play games, take part in social activities; inmates of institutions are refreshed by seeing new faces, especially young faces. The young today are quite extraordinarily generous with their time and co-operation. (Part of the problem of the adolescent with us has been that he has no respected role to play, and now that his help is being sought in many social situations where there is trouble, he himself gets an enhancement of his life, and his self-confidence as a result of being needed).

But mental hospitals differ and one has the impression that the contrast between the best and the worst is great. It is difficult to make any guess as to how far professed ideals are carried out in practice. There is public concern today about reports which keep on appearing in the press about neglect and cruelty in asylums. Des Wilson, in an article in the Sunday Times of February 10, 1972, referred to scandals at four mental hospitals in recent years. These stories include torture as well as neglect. Des Wilson stressed the need for a hospital Ombudsman. In this connection there are certain general points that strike one. One is that the overcrowding, beds nearly touching one another, that is commonly reported, *must* make for discomfort and depression. It must be impossible to give personal attention or do much listening when the numbers are so great. There is a lack of privacy. Incontinence is a fairly common incident; how miserable if you have to wait a long time before you are cleaned up, how humiliating if you are scolded. A second point is the great provocation to which a mental nurse may be subjected. Even with modern drugs a mental patient may have an uncanny insight into how to annoy and humiliate; it is not possible to discriminate between insolent or disgusting behaviour that should be attributed entirely to illness and the occasions when a patient is exploiting the tolerance of those about him, in order to persecute them. Nurses are trained to professional impeturbability, but humanly speaking they must get to the end of their tether sometimes. If a nurse *sometimes* relaxes his or her self-control, to neglect or insult patients, it must be difficult for him or her to make sure that these occasions remain quite exceptional.

But to be realistic one must recognise that there is another more horrible factor to be borne in mind. It would appear that in many human beings, if not in all, there is a congenital factor of sadism; that is, that it comes natural to take pleasure in watching or inflicting physical suffering. It is hardly possible to understand the accounts of scandals in mental hospitals without allowing for this motivation. Helplessness of the victim seems from all accounts to be one of the circumstances that are likely to trigger off sadistic attacks. Where very great numbers are crowded together it must be very difficult to prevent this by means of inspection; the terrified sufferers are usually too scared to speak. Training is needed to get this under control, and the self-respect of a professional ethic. But how difficult to provide effective training in every case, when we are so short of nurses.

II

Modern psychiatric thinking is focussed on the idea of "the therapeutic community", the community that heals. (Cf WHO 1953 Expert Committee on Mental Health). "The Mental Hospital should be a therapeutic community and, therefore, include the preservation of individuality, the assumption that patients are trustworthy, the encouragement of good behaviour, freedom, chances to show initiative, a full programme of activity." This idea has been worked out in a variety of ways. Mental illness seems to have a tendency to isolate the patient inside his own unhappy mind; and in family life and in a ward, he may spend many hours of the day alone, at the mercy of whatever may be going round and round and round in his thoughts. Whereas the sane normally make some sort of human contact with other people, even if it is only the token recognition implied in a remark about the weather, this does not happen naturally or with the same ease with mental patients (or, for that matter, with the aged compulsorily transported from their homes to institutions). They need help. The therapeutic community shares work, meals, recreation, sleeping quarters; and, in addition, much importance is attached to group discussion, even for patients who do not welcome it, in order to help them to move away from their very private unhappy world into the exchange of conversation and communication.

The idea of group discussion is modern, and the Quakers do not speak of it nor of the Retreat as a therapeutic community. But one can see that those who lived there *were* a community; many

patients stayed a long time, so that most of the people there knew one another well, they were spoken of as "the Family", and a great deal of their life was shared, with sane and insane participating together:—meals, work, the thee-and-thou of Quaker speech. They also shared in worship. Some patients went with staff to Sunday Meeting in York, and some of the patients frequently spoke in meeting. Communications from patients are apt to be a bit strange but Friends were, and are, very tolerant of this. On Sunday afternoons they had a service of their own, devised by Jepson; they all assembled and he read aloud "several chapters of the Bible". Few people sane or insane could today sit through "several chapters of the Bible" without becoming restless. But I think Jepson's beautiful voice, his homely Yorkshire accent, his humble devotion must have been a means of grace. When the reading was over "a profound silence generally ensued". Mad these people may have been, but they were good Quakers and the reading moved them to spontaneous silent worship. Many Quakers carry with them a sense of quiet confidence, as though the stillness they practise on Sunday stayed with them into the week. Visitors to the Retreat always noticed the peacefulness of the place. The notion of a therapeutic community had not been born, but the Retreat was a community which contributed to the healing process.

Today a further development is in progress. Some asylums have been profoundly affected by a new notion, which has invaded the psychiatric profession since the war. This is the concept of milieu therapy*. Milieu in this context means the human environment; and therapy means that this environment can itself be structured to promote healing and rehabilitation. The idea that we are affected by the human environment in which we live is not of course new. We are all familiar with the fact that public schools, for instance, have a noticeable effect in moulding character; we would say the same for monasteries, for the fighting services, and at one time we would have said the same about the universities. This is because these institutions turn out men whose characters usually differ somewhat from the image the ordinary man has of himself. What is novel is the recognition that *all* of us are *all the time* being moulded by the human environment in which we live, adjusting

* (In this section I am greatly indebted to David Clark of Fulbourn Hospital, for a conversation I had with him, and to his book *Administrative Therapy*, and to articles of his in the *British Journal of Psychiatry* 1963 and 1965).

our ideas as well as our habits to those of the people around us, though we don't realise that this is going on.

The psychiatrists were alerted to this fact suddenly by their own experience in World War II. Dr. David Clark wrote: "The 1939-1945 war tore psychiatrists out of the closed world of their mental hospitals, the cosiness of their psycho-therapeutic consulting rooms and plunged them into the turmoil of army training camps, tented hospitals and combatant units, and made them forcibly aware of the tremendous power of social factors for affecting men's thinking and feeling. This awakening led to group psychotherapy and to hospital experiments . . . and to Rehabilitation Units for Prisoners of War returning from captivity demoralised and desocialised". (*British Journal of Psychiatry* 1965, p. 947.)

Thus psychiatrists realised that asylum life conditions character and that in fact "a fine traditional mixture of charity and discipline which patients receive (was) acting as a practised technique for removing their initiative as human beings and making them patients". (Quoted by D. Clark, *Brit. J. of Psychiatry* 1963.) The word "patients" here recalls its Latin meaning, of people who do not do things but have things done to them. Reed (Army Institute of Research, US Govt Printing Office) comparing asylums, prisons, monasteries, boarding schools and battle ships, wrote: "New entrants are stripped of all that gives them individuality*, put into the lowest social grade under a privilege system with bizarre rules and punishments, and into a fraternalisation process . . . These and other studies have shown that the traditional organisation of asylums with centralized fault-finding authority and a rigid hierarchy and traditional patterns of medical and nursing relationship, tended to produce social crippling and deprivation in long-stay patients, which prevented their rehabilitation and discharge, even when their psychoses had remitted."

It is fair to say on behalf of the old asylum organisation here criticised that it was based on fear, which had been incorporated in the law. Fear of the insane is partly timidity in face of the odd and the uncanny, and partly a rational apprehension of danger.

*One might instance, name, home, activities, food preferences, clothes—one of the most repellent aspects of asylum life is that often patients cannot wear their own clothes. There is a common pool and they have to wear other people's dresses or suits, perhaps broken-down shoes, and underwear that may be permanently stained by other people's incontinence. Relatives may bring them new clothes, but these disappear into the general stock and are never seen again. (Cf. E. Goffman *Asylums*).

This fear is not fanciful; for instance Staffen, about 15 years ago, throttled a little girl and was sent to Broadmoor; he escaped from Broadmoor and in the few hours before he was recaptured he throttled another little girl. It was not irrational for the neighbours of Broadmoor to protest. Staffen was removed. As long ago as 1808 it was made an offence against the law to allow a lunatic to escape, and custodial vigilance became the prime duty of asylums. This was carried out by means of high walls around asylums and unremitting use of the *key* inside. The daily life and administration pivoted on the key; patients were locked up wherever they were and their movements to the toilet or occupation, to day rooms or night rooms, to meals or to classes were shepherded by attendants meticulously locking and unlocking doors. The constitutional structure which controlled what could be done and what could not be done, and by whom, was dictated by careful anxiety. There was a graded hierarchy of authority in a pyramid to the top which allowed only limited freedom to any worker. Within this structure personal behaviour could be humane or severe and it was traditionally fairly humane. The general apathy of patients was accepted as natural and unavoidable and convenient. In this policy the interests of the sane have priority and the insane have to take what is coming to them.

Insight into the inescapable effect of the human environment in altering and shaping individual character means not that this effect can be cancelled, but that it can be controlled. The problem now facing asylum doctors was to re-design the human environment in the asylum so that it should promote initiative and responsibility and put a value on originality. This was a hard task, made easier by the new drugs, which sedated the patient and greatly lowered the tension. There has been much experiment. Maperly Hospital at Nottingham discovered that the abolition of the key in 1965 made a marked difference; "As doors were opened, tension diminished, violence decreased, escapes became fewer. The nursing staff was gradually converted." (WHO loc cit.) Other hospitals had similar experiences. Fulbourn has made experiments in the restructuring of the authority pattern, and the idea of a self-governing community. There are in some houses daily meetings of staff and patients, for free discussion of whatever may turn up, especially "happenings" such as violent assaults, drunken episodes, thefts, shouting matches. There is uninhibited discussion of what has been done, and a system of free communication. Anybody may speak to

anybody and the sanctity of "the usual channels" has been abolished. Patients may make their complaints directly to doctors, not only to nurses; occupational therapists may protest in public that sisters or doctors are making their work difficult. In addition to all this, these meetings sometimes have to take decisions, as for instance whether a particular patient may go home or not. (There is no indication that the Retreat ever compelled patients to take responsibility by participating in decisions).

These meetings do not make life *easier* for anybody. Most of us in our jobs feel we have a right to the comparative security of knowing that we shall not be criticised except by those above us in the rank order, and then only in private; all this challenge and questioning and criticising must take a lot of getting used to. Some patients, and some others, find the sessions for self-government very stressful. This new kind of social order could not, I should think, be justified in terms of making people *happier*. Those who are organising it have a different value in mind. This is the maximum development of the potential of individual character, even for those who are not very gifted but average or sub-normal. The recognition of the development and self-realisation of the individual is widely felt today to be the supreme value that society ought to aim at. This whole idea is challenged by some people as sentimental; but if we doubt it we should ask ourselves the question: What should we choose for a child of ours, if we could choose? a placid happy life as a mongol or a life lived to the full extent of its capacities, at the cost of stress and strain?

There is some hard evidence at Fulbourn that these difficult methods have had some success; there are certain events that can be counted and as soon as you can count you can work out statistical comparisons; this is the kind of evidence some people find most impressive. There are, for instance, significantly fewer suicides, abscondings, outbreaks of violence, since the new regime was adopted.

There is another type of event also which can be counted and this is the discharge of a patient. Many more patients have been discharged since the experiment began and this is claimed as another index to the success of the new plan.

Is it?

III

This raises the controversial issue of the discharge or non-hospitalisation of the mentally ill. There is a new policy of pre-

ferring to treat such patients in their own homes, and this has the support of legislation. The whole rationale of our management of the insane was dramatically challenged by the Royal Commission on the Law relating to Mental Illness and Mental Deficiency 1945-1957. Members of the Commission visited asylums and came to feel that they were barbaric anachronisms; their regime, with its strict security rules, was already being rendered obsolete by changes that had been going on since the 1930s. In 1930 the Mental Treatment Act facilitated the admission of voluntary patients to asylums, without certification and, therefore, free to go away on 72 hours notice; experience since then had shown that very many mental patients could be satisfactorily treated without compulsory confinement. And since about 1955 the extraordinarily helpful new drugs had so altered the character of mental illness that many patients appeared quite fit to go home. The Commission swung right over from the old policy of custodial care in asylums to the view that "Community Care", that is treatment outside the hospital, should be regarded as the norm for most patients most of the time. Intensive treatment should be given when necessary in the mental wards of general hospitals; there should be quick discharge, with the possibility of attendance at Out Patients or an easy return to hospital when needed. The Mental Health Act 1959 implemented these recommendations. Thousands of patients have returned home, county mental hospitals have been gradually closing down, some general hospitals now have mental wards and also Out Patient Departments for mental patients.

Now the Quakers were strongly of opinion that home is *not* generally the best place for mental patients, for reasons that have not lost meaning today. Sam Tuke (in *Description of the Retreat* p. 135) says: "A patient confined at home feels naturally a degree of resentment, when those whom he has been accustomed to command refuse his orders or attempt to restrain him . . . (There is an) apparent absence of the social affections and sad indifference to the accustomed sources of domestic pleasure. The unhappy maniac is often unconscious of his own disease. He is unable to account for the change in conduct of his wife, his children and his surrounding friends. They appear to him cruel, disobedient and ungrateful. His disease . . . leads him to numerous unfounded suspicions. Hence the derangement of his affections may frequently be the natural consequence of either the proper and necessary or the **mistaken** conduct of his friends towards him." Patients today

who are on drugs do not correspond altogether to this account; but patients at home sometimes stop taking their drugs, and this account is not out of date for them.

Three years of experience at the Retreat convinced the General Meeting (the governing body) that early hospitalisation was of such great value that they ought to admit patients *free of charge*, if they really were too poor to pay the minimum fee of 4/- a week, provided they applied for admission within six months of the onset of their illness; this at a time when the Retreat was still heavily in debt.

The 1957 Commission, however, preferred "Community Care" to asylum care. Community is a fine thing and care is a fine thing, what could be finer than Community Care? and what does it mean? The Commission excluded from its meaning the care the community bestows by providing good hospitals. Within the meaning of the Act, Community Care included three basic forms of help for the patient. (i) His own family. One way of expressing what the Act achieved is to say that in a time of acute shortage of trained nurses it recruited hundreds, if not thousands, of untrained, unpaid nurses, most of them women, the mothers, wives, sisters, daughters of the patients, often without their consent and without notice. The National Health Service Report 1962 (p. 135) says "A decision on a patient's suitability for community care will have to depend . . . on the medical and social services available." It does not say that the circumstances or ability or indeed willingness of the family to cope with the patient need enter these considerations, and sometimes the family is not even informed that the patient is coming home. Inside a hospital no one would dream of requiring an untrained nurse to take responsibility for a suicidal patient, a maniac, a bad schizophrenic, with no one else on call. In the comparative isolation of the family this is the order of the day and danger often arises. (ii). The second aid is the patient's own family doctor. The NHS 1964 commenting on this says: "It will be many years before the General Practitioners acquire expertise in what for many of them is a new field of medicine." Even today an adequate training in psychiatry does not form part of the basic course for qualification as a doctor, in spite of the fact that mental patients form part of most practices. The GP is apt to feel at a loss, to say "Cheer up!" "Don't worry." "You do take your pills don't you?" (he often doesn't). "Be sure you keep your appointment at Out Patients" (he often doesn't). (iii). Mental Welfare Officers were to

provide a third element in Community Care. At the time the Act was passed, these were untrained men and women, often men who had had experience under the old Poor Law (abolished in 1929) as Duly Authorised Officers, a chief part of whose duty was to get insane people into lunatic asylums as certified patients to be detained compulsorily. There were at that time Psychiatric Social Workers, who were very well trained; but there were few of them, and they were mainly employed in Child Guidance Clinics and in hospitals. The Act makes no mention of them or of the contribution they could make in helping the families who had patients at home. The social services have now been reorganised and workers are no longer specialists; so today if a social worker visits the home of a mental patient, she, or he, may be someone who has been trained in the care of spastics or handicapped children, or whatever.

These three forms of care were not thought enough. The NHS 1962 lists other social services that they considered to be needed—“domiciliary and medical nursing, social services, after-care services, including hospital Out-Patient Departments, occupation, sheltered employment, residential accommodation for patients leaving hospital, when a home or relatives were not available or not suitable, social clubs” and so on. Some of these were to be provided by the local authority, some by voluntary enterprise; the sheltered workshop idea had been pioneered by the ex-Services Welfare Associations. But not much of this programme had been realised or planned when the Act came into force. Day centres, sheltered workshops, occupational classes and so on are of great importance for the family, because if the patient can be persuaded to attend them the family can be relieved of responsibility for a certain time, to relax or to get on with urgent jobs.

In 1962 the NHS reported that “there has been considerable publicity of the possible effects on other members of the family and on the stability of the family itself when a sick person is returned to his home or remains in his home instead of having prolonged hospital treatment . . . it is important not to put too much strain on the family . . . but easier movement between hospital and home . . . helps the eventual recovery of many patients. The limited number of Psychiatric Social Workers is a severe drawback”. In another passage the NHS acknowledged that “many families need further counselling”. In its report for 1963 (p. 131) it says “Persons beset by anxiety, fear and depression, the

common accompaniments of mental illness, require a full measure of personal understanding, and if this is denied them, may resort to primitive and socially unacceptable methods of self-expression". Now understanding of mental illness is exactly what the baffled family know they have not got. One of the difficulties of the family is that most of us have been taught to keep a stiff upper lip and not to whine; it is, therefore, very hard for the ordinary person not to think that the patient is morally reprehensible, because he indulges in self-pity and won't pull himself together. "He is his own worst enemy" they say. If they take a bracing line and tell him to get a grip on himself, he is likely to feel misunderstood and not sympathised with, and to resort to "primitive and socially unacceptable methods" of expressing himself. This sounds very unpleasant. The family need explanation and information. Yet in 1966, when the NHS reported that "energetic health education is needed, not only in a general way, but focussed specifically on some groups such as health service personnel, employers, teachers and those who take patients as lodgers" they curiously did not include the family as among the groups who needed this health education.

The mentally ill, when they get home, sometimes celebrate their freedom by refusing to have anything more to do with drugs. The drugs they were taking in hospital may have restored them to a normal or near-normal state of mind, but they often have unpleasant side-effects, such as a dry mouth or constipation; the hospital nurse has a kind of authority that the wife does not have; and the refusal of drugs may bring back the full force of the illness. Some hospitals try to overcome this difficulty by organising Out Patient treatment and injecting patients with sedation to last several weeks. But patients may refuse to go to Out Patients.

I am permitted to quote two accounts of mental patients in the home. The first is from an anonymous article in *Care*, June 1972. "My son was 25 years old when he was diagnosed as being schizophrenic. The shock left me numb and the one word *schizophrenia* kept running round in my head all day whatever I was doing, and all night too, when I woke up from brief periods of sleep. I felt as though I were living through a nightmare. In this state I had to answer questions, questions about family relationships, background, upbringing, which I knew had to be gone into, but which left my husband and myself feeling so guilty and inadequate—I felt somehow that it must be all my fault—and also we felt ignorant of how to help our son, and ignorant about the illness itself, which until

now was one of those things which happen to others, not to us.

After a period in hospital, my son was discharged and we began to realise how difficult home life was to become. Before this he had been living away from home. We had several other younger sons still living with us. Normal social life now became non-existent for me, and the rest of the family felt that they could not bring friends home because of the unpredictable and unpleasant behaviour of their eldest brother. They were wanting to help him but just did not know how. The attitude of some neighbours and friends grieved us, until we realised that we would probably have reacted in the same way through sheer ignorance.

Within a short time my son had to be re-admitted to hospital and we realised that this was something we should have to live with for a long time. My son then discharged himself from hospital—this I found to be one of the most nerve wracking things about his illness, as he has done it several times, just turning up without warning at home. Once I was in bed ill when he came and I was harangued by him for being lazy—I was alone in the house and none of the rest of the family was due back until the evening. Another time I was out shopping and he was waiting in the house when I returned; he was aggressive because I had not been there to receive him. We were all learning to be afraid of him. He blamed my husband and myself for his illness while at the same time saying there was nothing at all wrong with him, that he need not go to see our family doctor, much less go back to hospital. It was about this time I saw a doctor at the hospital and asked questions about the illness and what we could do to help our son. I cannot describe the relief that flooded through me, when this doctor indicated to me that he thought I was living under too great a pressure. It was one of the rare times that any of the medical or nursing staff has shown signs of understanding our difficulties. About this time also I picked up at the hospital a leaflet about the Relatives Group, which we joined, and from then on I did not feel so isolated with my problem: I felt the caring and support of others who understood what we were experiencing.”

A friend of mine told me about how her daughter came home in the middle of a mental illness and this is a happier story. The girl was in a private nursing home, and wrote to say that she felt she could now manage life at her own home and she would like to come back. Her doctor did not think she was well enough, and advised against it. But the mother wrote to say, If you wish to have

a try, come. Then followed about 18 months of difficult stressful family life. A younger daughter was jealous of the incessant and intense care that the mother was giving to the ill girl; the ill one was always wanting to take risks, for instance to ride her bicycle; the mother suffered from intense anxiety, but the ride, up and down the road they lived in, was a success and the girl did not want to ride again, now she had proved she could do it. She had a room of her own she could retire to when she found family life too much, especially when she wanted to cry. The mother did not know whether or not to encourage her to fit in to family life in the ordinary routine, of meal times and so on. Her feeling was that she should try to ease her back into normal ways; but the psychiatrist whom she consulted on this point said—No, let her work it out herself, don't put pressure on her. The mother had very great confidence in the girl's intelligence and courage, and she did let her manage herself. The effective factor in her recovery was the help of the doctors, especially the gifted and devoted psychiatrist. But the mother does not think she would have ever recovered if she had stayed in hospital, she feels an institution cannot stimulate convalescents to take responsibility. She also feels that the experience in a way did *her* good, she learnt a lot. The family recovered from its time of stress. Her view is that the way you react to psychiatric illness is a function of the temperament you have got, and that it was her daughter's inherent strength of mind that enabled her to pull through.

One cannot help commenting that it looks as though the mother's confidence in the patient must have been an enormous help. How much harder it would have been for both of them if the girl had not been the kind of person whom her very able mother could in her heart of hearts respect. This story also brings out the point that money is a great help. If you have a large house and can find some domestic help or paid care, the family can be to some extent protected against the noise and turbulence introduced by the patient.

It is thus clear that the situation in the home where there is a mental patient may vary from what is tolerable, if there is a good deal of tolerance in the family, to the intolerable. A manic depressive in the manic phase may insist on spending his money recklessly and disastrously; or he may have violent rages so that his children live in fear; a suicidal patient may require incessant watching, but watchfulness cannot be incessant, the watcher may be called to the telephone or have to go to the lavatory. It is des-

perately miserable to have to live with a depressive. Families are likely to be haunted by a sense of guilt knowing that some psychiatrists say that all mental breakdown is due to faulty human relationships.

When the situation is intolerable there are two ways of taking it; one is the way of the love that endureth all things, the utter devotion that will not let go; it is commonly said that this kind of love costs "a life for a life", the one who has given the devotion may herself, or himself, have a breakdown, and suffer the misery of pathological depression, and this may not be curable. The family may badly need this person to be sane.

I do not think many people can give this utterly selfless love for an indefinite time. Marriage is said to be a matter of give and take and not of one doing all the giving. In this case there are several things that might happen. A marriage might break up. An unmarried daughter might marry or take a job elsewhere and leave the home, but it is not likely that daughters who have been exploited for a long time will have the strength of character to do that. If there is no break-up the family have to drag along as best they may. Such overstrain of human relations must surely produce love-hate. (Perhaps, as some psychologists say, all love is love-hate, in the sense that if you love somebody very much you are very vulnerable, very dependent on reciprocity in love, and the beloved can hardly help giving pain sometimes). But then love-hate can deteriorate into hate. Hate can be controlled into unselfish behaviour for a long time, especially if there is fear in the relationship. Hate poisons life. If hate springs up where love once was there is misery all round, for the one who hates instead of loving, for the one who is hated and gets to sense this; probably both have a deep sense of guilt. To know yourself hated and feel that you deserve to be hated and to be unable to stop deserving it "why, this is hell".

The alternative to love-hate becoming hate at home is a much less stressful situation in hospital, where the patient will take his drugs, and probably be a bit better, and where nobody will be hurt very much by anything that he says or does. But the orthodox policy is not to allow this less painful alternative but to insist upon "community care" by not taking steps to prevent such a patient going home at will. And in aid of what? It is said to be in aid of the autonomy of the patient, his freedom to make up his mind for himself. Is it freedom to be made to take decisions, when, if you

were in your *right* mind you would never make the choice to afflict your family in this way? For my part if it is my destiny to become mad and say horrible things about those I love best, I would rather be allowed to say them in hospital where nobody will mind, than helplessly to hurt my near and dear in this way.

One ought to bear in mind the interests of children. It used to be assumed and perhaps still is that children are unaffected by what happens to the grown-ups; they have their own interests and day dreams. *High Wind from Jamaica* used this theme. But is this true? Children often don't speak of grief or anxiety or disappointment, because they can't find the words or they think no one wants to listen. But they are damaged by the traumatic experiences of the family, the grief about the grandmother who comes to their home to die slowly of cancer, the anxieties about money, the fear of rages breaking out. They need self-confidence in order to develop the potential personality within them. Without self-confidence they become distorted. There is also the problem of the adolescent; who would wish to bring a boy-friend or a girl-friend into a home where there was a manic depressive and you had to take his bizarre and unpredictable behaviour for granted? But the boy or girl who can't bring friends home is greatly thwarted in the business of trying to understand and assess human nature, of learning courtship, learning *savoir faire*.

IV

It is fair to try to look at this problem from the doctor's point of view. The important thing is that they are succeeding, to some degree, by the new permissive method, in working out novel forms of therapy for patients, some of whom have hitherto seemed to be hopeless, and are also learning a great deal. This is a very exciting breakthrough and it is also very exacting work. One can see that it must aid this creative experiment to be able to get rid of the most hopeless patients, by announcing that they "won't co-operate" and sending them home. Doctors may feel that the family is a very tough institution and does, in the course of nature, put up with a lot; so the family can reasonably be expected to learn to live with insanity. But the NHS has acknowledged that "the stability of the family itself" is threatened by these traumatic stresses.

Doctors today want *results* and long-term care with no change does not interest them. Perhaps they are too deeply and emotionally involved in their difficult hospital work to be able to know or under-

stand very vividly what they are doing to these families. I was at a meeting when members of such families were talking to a psychiatrist about their difficulties. He commented "Well I can see that it is a strain to have your relative at home, but you must remember that the alternative would be to have all the strain of knowing that your relative was in an institution, and this I suppose would be as bad". This revealed that he had not the slightest idea what the family strain amounted to, nor how great is the relief when an institution comes to the rescue. This doctor was implying a horror of "institutions", which is by no means always justified nor always felt. A friend of mine recently spent some time in a home for old people. She found the typical inmate was not depressed, did not feel she was a burden to anybody, as she would have been in the house of a relative, felt in fact that it was quite in order for her to have the attention she needed, because she was paying for it;* there was companionship among the team of ten, including part-timers, who ran the place, and this was a jollier set-up than the one/one relationship with a relative. Incontinence is a trouble in the home and often causes a feeling of guilt; in a hospital it is taken for granted as part of the day's routine. My friend said it was "a lovely thing" to be involved in a job of this kind with a team of others. These old ladies were not mental patients, but a good many mental patients are sensitive to what is going on around them and would feel as the people in the geriatric home felt. The absence of emotional strain which is characteristic of the professional nurse can provide a much more peaceful atmosphere than the anxiety natural to the family.

A senior psychiatrist said to me: "Every social worker in the country has heartrending stories of the troubles of families that have mental patients at home." The medical attitude seems to be that this extreme distress in the family is the price that sometimes has to be paid for the chance of recovery, improvement, or slight improvement in the patient. Under the old dispensation, the insane were being sacrificed to the interests of the sane. Now it is the other way about, the sane, including sane children, are being to an unknown degree sacrificed to the interests of the insane. In a case of claims and counter-claims of this kind, who is to say where the greater claim lies?

* A non-paying patient can be reminded that she has made her contribution to public funds through the indirect taxation she has been paying all her life, on every pound of tea and other commodities and in National Insurance.

This is a question which our society has barely begun to consider. It will take a lot of thinking. I have not got an answer, but I would like to propose three prolegomena to the discussion. (i). Nobody's claim should be neglected, all should be considered. One way of neglecting a claim is to make sure you never or rarely see the suffering person face to face, but deal with it by hearsay. I do not believe that if doctors *saw often* the families that suffer most they could keep up the present system without modification. (ii). The medical profession is involved in terrible problems, they do a lot of thinking about medical ethics. The notion that medical ethics are an agreed system is however mistaken; different doctors proclaim very different principles in the name of medical ethics. The whole community should play a part in thinking out these questions, which are very difficult indeed.

(iii). There is one moral principle, which once held great sway, which ought not to satisfy Christian or humanist opinion, that is that the greatest happiness of the greatest number should settle any issue. This principle could have been used to justify gladiatorial games, the thousands that enjoyed watching the bloodshed were far more numerous than those whose blood was shed to make a Roman holiday. In the present case we could argue that the insane are a minority; it is commonly said that one out of every nine people will have a period in a mental hospital, so that the sane outnumber the insane by nine to one.* Or, alternatively, we could argue that the families that suffer as I have described are a small minority, most manage to look after a mentally ill member without such traumatic distress. But this of course is only a guess; proper investigation of the matter has not been undertaken. One senior psychiatrist told me that he had done a survey of some hundreds of patients discharged from his hospital, and found that "a majority of them were leading satisfactorily adequate lives out of hospital." He did not say what sort of a majority he found doing so well, it might have been 51%; nor what he meant by "satisfactorily adequate lives", a very careful phrase. It is perhaps satisfactory if a suicidal patient has survived for some months, but they may have been very bad months for the family. On the other hand a hospital in the south of England made an investigation of the families to whom their patients had been discharged. Their finding was that

* This estimate keeps on changing; it is now sometimes said that one out of *five* will spend some time in a nursing home; but four to one is still a majority for the sane.

“Community Care” was adding to the number of mental patients that required care, because the strain was so great that members of the receiving families themselves broke down and became patients.

But however you reckon the majority, it is brutal to say that what suits the majority is what the minority must put up with. A civilised society should do better than that. I would suggest that the present situation is not an impasse. The permissive regime in hospital, and the freedom of many patients to go home, could be managed with less cost to the family, provided doctors do not accept things as they are with complacency. (i). They should be far more careful not to discharge or permit the self-discharge of patients who are very sick. This would certainly cost trouble. A patient detained against his will, on the ground that his doctor has affirmed in writing that in his judgment the patient could be a danger to himself or to others if he left the hospital, has a right of appeal to a Mental Health Appeal Tribunal, on which there are laymen as well as doctors. It must be distasteful to a doctor to have to try to persuade laymen that a plausible manic-depressive, for instance, who can put up a very good show for a limited time, is really very ill. And it would require some reorganisation, at least in some hospitals, to provide a place where the severely ill could be detained with dignity and security, with some freedom of movement; or to arrange for their transfer to a high security hospital, Broadmoor or Rampton. (ii). Much better liaison between hospital and the family, hospital and the general practitioner, hospital and the social services could lighten the stress. Hospitals seem to manage these liaisons badly, and one is astonished that they so often seem not to care to communicate as they should, not to mind when these failures are mentioned. (iii). Steps ought to be taken to provide the ordinary GP with more knowledge of psychiatry as part of his basic professional qualification. It is, I suppose, assumed that he will pick up a good deal of psychiatric know-how as he goes along. Most doctors have mental patients in their practice. But there is the difficulty that many GPs are too busy to do much listening, and if they cannot listen, they will not learn a great deal. There is another difficulty that, if one may judge from impressions, there are still GPs who share the feeling of the lay, that some mental illnesses are very irritating, and they can't believe that the wretched patients could not pull themselves together if they made an effort. This betrays sheer ignorance. (iv). More and better trained Psychiatric

Social Workers are needed; this seems to be acknowledged but is enough being done to remedy the present shortage?

(v). The families who have to undertake mental nursing need more training, counselling, and knowledge. This is not the simplest thing in the world to arrange, because some families are too humiliated by their trouble to wish to expose themselves in group discussions and seminars. But with the help of mental welfare visitors, who could give some counselling in the home, and also encouragement to go to family meetings, this could surely be got over. Then recognition of their predicament by others will be a comfort to them and there is much that they could learn which would help them. In fact, it is the *families* of the insane who need community care.

We are coming to realise today that there are enormous and painful gaps in our public provision for various forms of distress. Governments are active all the time in efforts to meet these. But the organisations that are set up are always short of personnel; there are not enough individuals who care. In the past the Christian Church has been wonderfully sensitive to various forms of need, and practical in developing services—hospitals, schools, poor relief, service to lepers, the emancipation of slaves, campaigns against drunkenness and many more. There is a great need for such leadership today; we need a new St. Vincent.

Approaching Acupuncture

Jonathan Green

I

With their development of techniques of Acupuncture, the Chinese have discovered one method of medical treatment totally strange to Western Science. The nature of this treatment arises logically out of a Chinese medical philosophy rooted in Taoist mysticism, and a mention of this mysticism—however brief—must be the starting point for any description of the medical treatment. For the Taoists the central conception is that of the Tao. In literal translation this word means ‘Way’: the Tao is the ‘Way’ of nature, an expression of its harmony and internal necessity: “Heaven cannot help being high . . . the sun and moon cannot help going round, and all things cannot help but live and multiply. Such is the operation of the Tao . . . What gives life to all creation and is itself inexhaustible, that is the Tao.” (Chang Tzu, Chapter 2).

Operating within the Tao are the complimentary forces of Yin and Yang. The characters for Yin and Yang mean respectively the shady and sunny side of a hill and this may have been their origin as the embodiment of polarity and duality in human experience. Yang is the active force, controlled and shaped by Yin: the Yin-Yang duality was embodied in dualities of death—life: stillness—motion: meditation—action: confusion—order, and so on.

The supreme goal for any man was to live in harmony with the Tao: “the sages were tranquilly content in nothingness and the true vital force accompanied them always . . . their spirit followed in harmony and obedience with Tao, the Right Way . . . thus how could illness come to them.” (Nei Ching Chapter 1). So the Chinese conception of illness was an expression of Man’s deviation from the Tao, a stress between the individual and the world. The perfection of the Tao is expressed as the balance of the two forces of Yin and Yang throughout nature; thus illness is seen as an imbalance between Yin and Yang within the body; its origin in a wider disorder between man and Tao, its expression as physical or mental symptoms.

The life force, *chhi*—the ebb and flow of the Yin and Yang—was said to run in vessels called meridians (some of these are shown in Figs. 1 & 2). In disease the imbalance of Yin and Yang in the

body was accompanied by a blockage or imbalance in the flow of *chhi*; and the practice of Acupuncture is based on the theory that insertion of a needle at certain points along the meridians could either unblock them, or re-establish harmony by drainage or stimulation of the forces.

The first needles were probably shives of flint found on mountains; these were replaced gradually with metal—so the Yellow Emperor (circa 210 BC) says: “As far as treatment is concerned, I wish that they might not only rely on the prison medicines and might not only use flints, but I should like them to insert thin needles into the vessels and bring into harmony Blood and Chhi, so that both might circulate in the vessels without hinderance.” (Nei Ching).

In 510 BC a case of coma was cured by needling at the forehead: this is one of the first documented reports of the use of Acupuncture, but it is likely that shives of flint were used as far back as 1,500 BC.

Important in the theory of Chinese medicine was a complex system of Anatomy. Consistent with their cosmology and number concordances, rather than the results of dissection, there were twelve main organs: heart, liver, spleen, lungs, kidney, stomach, large intestine, small intestine, gall bladder, pericardium, bladder and triple warmer. These organs performed a symbolic role within their cosmology. In common with some other early medicines, the brain was considered to be functional merely as a store of mucus and tears.

The meridians form a complex system of connections between organs, each meridian originally having a ‘target organ’ (although this relationship has been modified over the years, it is now more an *area* that is associated with a meridian). Thus, needling of a meridian can have a tonifying or depressive effect on the particular organ connected with it, as well as often having a more general action.

I visited an Acupuncturist working at Seaton in Devon. He had got his degree from the British Acupuncture Association and had been practising for about ten years. He had not studied Western Medicine (many Acupuncturists have) and he rejected most of it absolutely—his approach to Acupuncture was through traditional Chinese philosophy.

My examination followed a set pattern; a general one, as I had gone with no complaint. It started with my hands, feeling their

texture and examining them closely: palm and back and the fingernails. He palpated the thenar eminence, feeling for the tone of muscles—similarly the tone of my arm was felt.

Then taking my wrist he felt the pulse. This is the most important part of diagnosis; a sensitive doctor claims to be able to diagnose the extent and nature of most diseases from its emanation at the pulse. He felt the pulse for about five minutes in the left and then right wrist. Again he examined my hands.

After this came palpation of various meridian points to test their tenderness. My reaction was, of course, subjective and often the pain of the point was difficult to distinguish from the mere pain of his pressing, but on some points there was a particular tenderness. These tender points follow, with the meridian sites they represent. (I worked these out later).

- 1). Just anterior to the Achilles Tendon: (K4 on Kidney Meridian).
- 2). The midline of the sternum at the level of the 4th Costal Cartilage (Conception Vessel Meridian 18).
- 3). Just caudal to the Xiphisternum (C.V. Meridian 15).
- 4). On the sole of the foot (Kidney Meridian 1).
- 5). Thenar eminence (Lung Meridian 24).
- 6). Deep in the Infra Clavicular fossa in the mid Clavicular line. (Lung Meridian 2).

The diagnosis was that 1) Kidney and Lungs were underactive, 2) Prostate and Pituitary were underactive—a diagnosis that is a logical conclusion from the symptomatic points outlined above, if one refers to the relevant Chinese texts.

The diagnosis refers to an energy imbalance, a potential illness, rather than the symptom of hypofunction in Western terms. If untreated the kidney/lung deficiency would lead (he said) to skin trouble and rheumatism later. The treatment would correct the imbalance before the symptoms appeared. He took a steel needle and inserted it about 2 mm into the lower medial part of the leg (on the kidney meridian), twisted it and took it out. There was no effect and he tried in a slightly different place—this time there was a definite feeling, a sharp twinge spreading up my leg (not down) like an electric shock or as if fibres in my leg were being twisted by the needle. This was repeated at several other points on my

thigh and at still other points moxibustion was used—the burning of a cone of moxa on a point to stimulate it.

This was the only treatment he gave me, although he emphasised that a full continuing treatment and a cure would include not only more needle sessions, but a diet regime, yoga and breathing exercises. Acupuncture in China has never been used in isolation; it has always been a practical popular medicine within the larger context of the whole medical system—which included a large materia medica and some of the earliest known vaccination procedures. Also, most importantly, it contained this ideal of health as a personal harmony with the Tao, so that much of the responsibility for health was on the patients' shoulders: in the practices of meditation, respiration techniques, the use of *coitus reservatus* (which directed pure Yang energy up to the brain), diet, and sun-bathing, keeping healthy becomes a matter of personal discipline.

This was a system operating within a relatively sophisticated knowledge of diseases: in one of many medical texts, detailed descriptions of many diseases such as smallpox, phthisis, beriberi, hepatitis, bubonic plague, acute lymphangitis were given by Ko Hung (281-340 AD), Taoist Alchemist and Pathologist. He had a scientific mind "very much better than anything the contemporary occident could produce" (Needham). A snatch of it can be seen in this excerpt from his writings: "When I tell the Common People that li ching pills and shi shun broth can cure cholera, coltsfoot and aster can cure persistent cough, cirtornium is good for worms, angelica and peony for colic and so on . . . they doubt it and prefer to believe wizardry." (Quoted in Huard and Wong "Chinese Medicine" p. 27).

Acupuncture is the purest treatment in the medical canon in that it rectifies at its root the imbalance causing disease. This is complimentary with the great emphasis put on preventive medicine by the Chinese: there is a tradition that Chinese court physicians were only paid as long as their patients were healthy, and that they had to finance themselves any medicines used once disease had occurred. Treatment was based on the same lines as our dental service—a regular examination every six months whether sick or well.

I had been warned that my first treatment might produce an initial adverse reaction but that this was a good sign of my body's responsiveness: so the reaction I had could be said to be good, I had a fever of 102° for almost two days after and could not hold any food. But this gave way to a strong feeling of brightness and

equilibrium, a feeling of freshness which lasted for about two weeks.

II

The reaction of western scientists and doctors to Acupuncture has been a compound of two familiar attitudes. First, a re-classification—"Oh, its all hypnosis . . ." which although meant as an answer is of course none, but only the posing of more questions. Second, the attempt to isolate the treatment from its context and interpret it within the framework of present scientific knowledge, as if the pure light of science was saving this treatment from the hands of a primitive people. There are familiar preconceptions lying (consciously or unconsciously) behind such reactions, and any approach based on them will be incomplete and probably not very revealing. I hope to show that the significance of Acupuncture for Western Science and Medicine is rather greater than these kinds of analyses suggest.

Acupuncture can be seen within the context described in Pt. I as a highly practical popular medicine, arising logically out of the cultural and philosophical climate of China. To take it out of this context and give it a place in our present culture, it is clear that we must demystify it, analyse and test it empirically. But don't let us forget how much we may lose or how much we may distort by imposing too quickly and too rigidly our present categories of thought—it is our *methods* and not our *models* that we should use. At worst the analysis would reduce Acupuncture to a glorified telephone exchange; and this would entirely miss the point.

This section, then, is a *comparative* analysis of two systems of thought. Rather than interpreting one in the light of the other I want to show where the common origin of both ideas might lie.

Influenced by Western Science, the Chinese have themselves been carrying out experimental work on Acupuncture for some time—although much of this has remained untranslated. In Korea, Dr. Kim Bong Han claimed histological evidence for meridians and points; he prepared slides of egg shaped cells which he called 'Ki centres' and fluid filled ducts of 2-50 μ diameter running between them. He claimed that the centres were able to influence each other via the ducts, and that they could be traced by radioisotopes.

It seems that this work has been discredited by independent experiments in Peking.(¹) I don't think many people would seriously claim now that the meridians exist as *anatomical structures*, although

(¹) My thanks to Dr. Joseph Needham in conversation for this information.

work has been done to show that there are patterns of charged electrical resistance on the skin corresponding to meridian patterns (see Niboyet 1951). Since resistance tends to vary randomly over the skin in any case I think such claims would be hard to prove—but partly as a result of this work, some Acupuncture is now done with an electric current passed through the needles, and this has been successful in some treatments. Other special properties (some of which I will describe later) have been claimed for points and meridians; their particular disposition therefore seems to have significance on a number of different levels. I think there is a definite reason for this—as I hope to show later.

In terms of their philosophy, the Chinese might have considered such arguments about the existence of meridians to be purely irrelevant. A parallel case: of their conception of the five elements: Water, Fire, Wood, Metal, Earth, Needham says “the conception of the elements was not so much one of a series of five sorts of fundamental matter (particles do not come into question) as of five sorts of processes. Chinese thought characteristically avoided substance and clung to relation”.(*) In a similar way, the concept of meridians could be said to describe the fact that *chhi* flows and the *process* of its flowing.

The idea of a tubular system connecting inner organs with the surface was also common to both Greek and Egyptian medicines. In particular, the Egyptians had a notion of a ‘cord’ connecting the 4th finger to the heart (the finger thus took on a special significance: hence its use for the wedding ring dating from Roman times), and this is a notion resembling the heart meridian. And, significantly, the connection has an anatomical basis: the innervation of the 4th finger (palmer branch of the Ulnar Nerve) has spinal roots C₇ and T₁—and it is from T₁ that Preganglionic sympathetic fibres contribute to the Stellate Ganglion, which in turn forms part of the sympathetic innervation of the heart. This is a particular case of what seems to be a general rule; that elements of the meridian system are disposed in such a way that they show similar anatomical connections with their particular target organ. The morphological similarities between meridians and cutaneous nerves are shown in Figs. 1 and 2. Some Somato-sensory fibres running in these nerves synapse in the lateral column of the spinal cord with sympathetic or parasympathetic neurones (see Fig. 3), and these neurones send preganglionic fibres out to form part of the autonomic system

(2) “Science and Civilisation in China”, Vol. II p. 243.

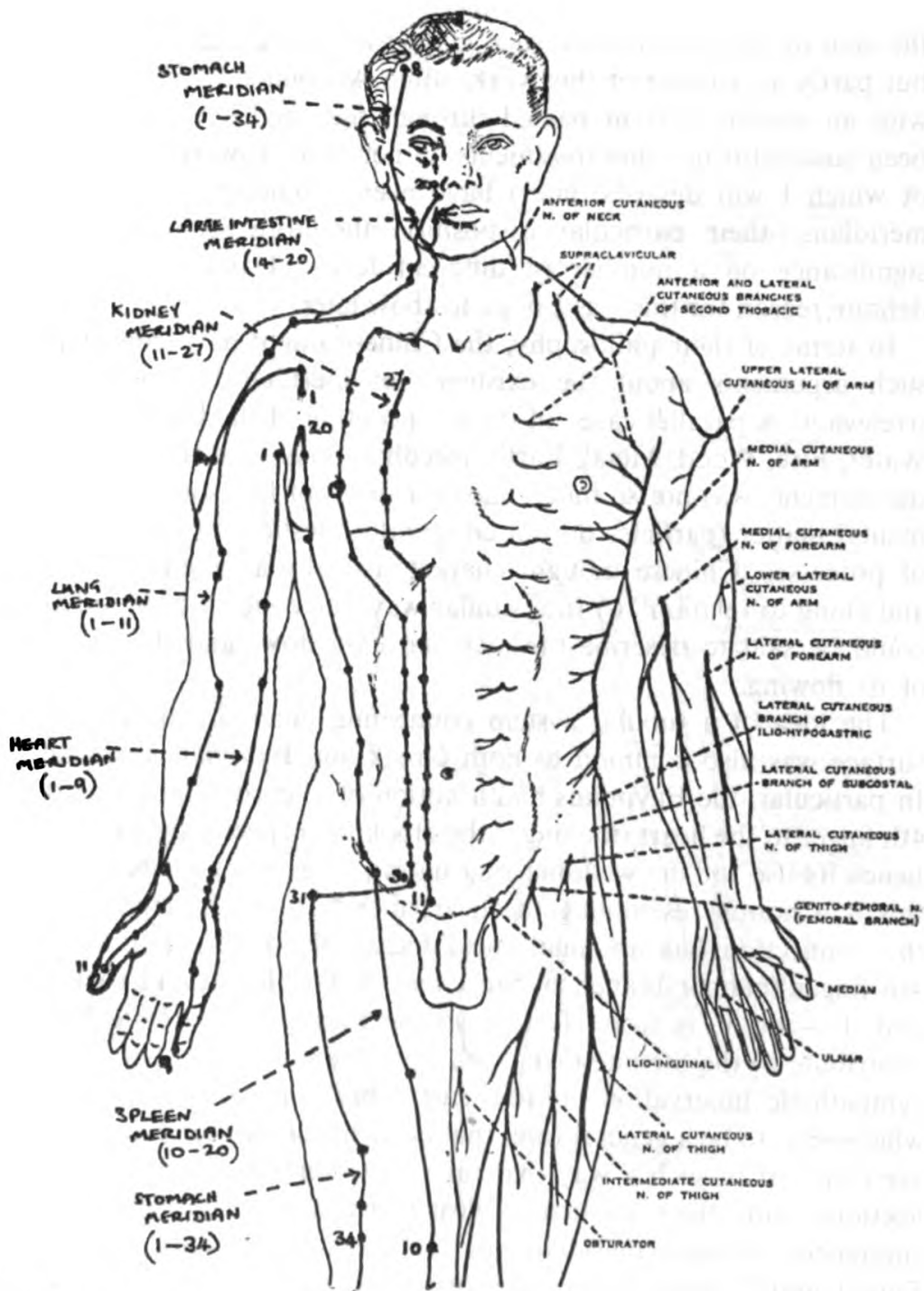


FIG. 1
MERIDIANS AND CUTANEOUS NERVES — diagrams compounded by mapping meridians redrawn from Dana Heroldova, and cutaneous nerves from "Text Book of Human Anatomy" ed. W. J. Hamilton.

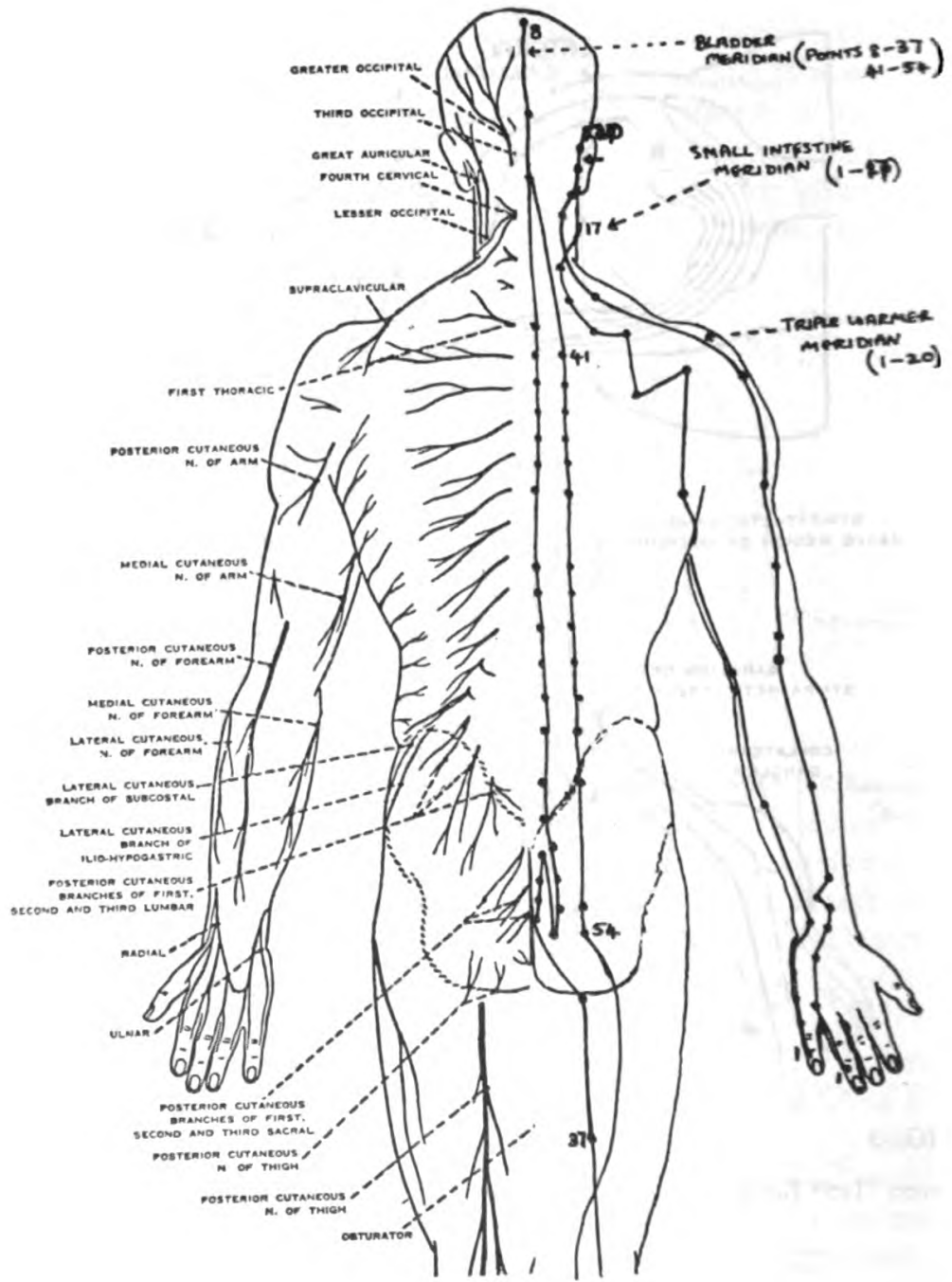


FIG. 2

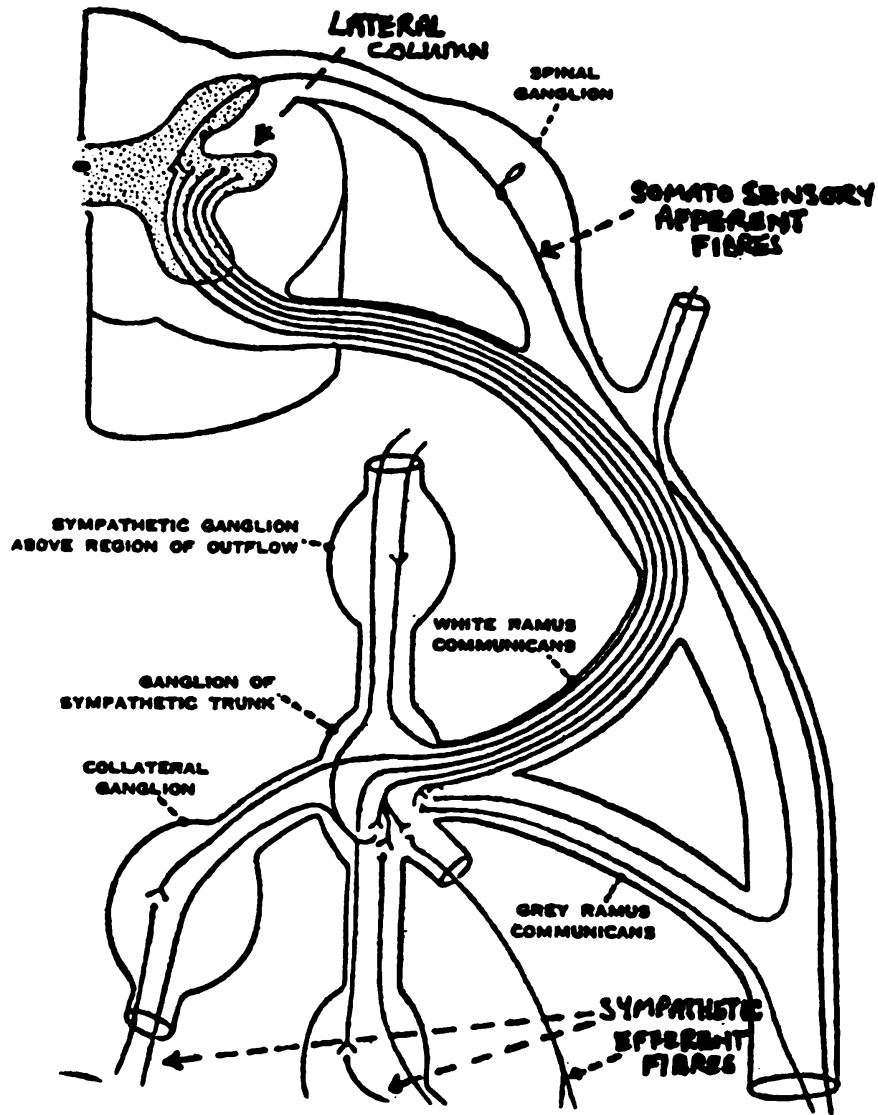


FIG. 3

From "Text Book of Human Anatomy", ed. W. J. Hamilton.

innervating the viscera. The following table attempts to clarify these relationships in detail for some meridians.

Efficacy of Meridian (*)	Corresponding Cutaneous Nerves (figs. 1 & 2).	Spinal Roots (C = cervical) (T = thoracic)	Autonomic Nerves from these roots (S = sympathetic)
HEART MERIDIAN	Medial Cutaneous Nerve of Arm		From T₁ sympathetic fibres to heart.
Heart diseases	Med. Cut. Nerve of Forearm Palmar branch of ulnar nerve	C ₆ T ₁	(Rate increase and dilation of coronary arteries).
Tonsillitis			From T ₁ : S. to Sup. cervical ganglion / to tonsils via sphenopalatine nerve (vasoconstriction).
Cold sensation and muscular spasms in Upper Arm.			
KIDNEY MERIDIAN	Anterior cutaneous branches of Thoracic Intercostals		
Kidney		T ₁ ↓ T ₁₂	S. from T ₁₁₋₁₂ to renal plexus
Constipation, Vomiting, and other intestinal disorders.			S. from T ₁₋₁₂ : Thoracic splenchoric nerves innervating gut to splenic flexure.
Bronchitis, Asthma.			S. from T ₁₋₄ to upper ganglia of sympathetic trunk and thence to bronchi. (broncho-dilation) ⁴

(3) Information as to efficacy is from "Acupuncture & Moxibustion", Dana Heroldová 1968. 'Efficacy' implies both that the point may be tender as a result of disease and that treatment may be applied at that point. In terms of sympathetic nervous action, these two meanings are sometimes contradictory.

(4) Cf. here the Western treatment which is typically Salbutanol, a sympathomimetic, bronchodilator compound.

Efficacy of Meridian (°)	Corresponding Cutaneous Nerves (figs. 1 & 2).	Spinal Roots L=lumbar	Autonomic Nerves from these roots (S=sympathetic)
SPLEEN MERIDIAN Spasms of the uterus anuria, irregular menstruation scrotal neuralgia. Pain in lower abdomen. Appendicitis (especially point 13) ⁵	Medical Cutaneous Nerve of Thigh Saphenous Nerve	L 2, 3, 4	S : as lumbar splenchnic nerves from L 2 to uterus ureter, bladder. Lumbar splenchnic nerves to the intestine below splenic flexure. Spinal segments T ₁₀ - ₁₁ supply S. to caecum and appendix (there is thus no direction correlation here).

A similar analysis could be extended to other meridians—the pattern is established.

I would not claim that this approach is all inclusive: there are often other target structures claimed for the points, which I have not mentioned (although they are on the whole less important); the analysis does not begin to do justice to the variety and subtlety of meridians and points in the Chinese formulation, or of their cosmological significance. What it does show, on the other hand, is that the meridians are *not* arbitrary, that they do have an internal logic which is in itself compatible with our anatomical knowledge. We have seen two sets of relations in western anatomical terms: firstly a patterned innervation of the skin from segments of the spinal cord (at its simplest, for instance, the innervation of the arms comes from the upper segments and the innervation of the leg from the lower segments). This is the relationship between columns 2 and 3 in the table. Secondly, there is a similar patterned autonomic innervation of the viscera from the same segments: the relationship between the 3rd and 4th columns of the table. These two relations need have no connection physiologically (although I will postulate below that there might indeed be such a connection); for we have seen above (see fig. 3) that they are anatomically connected, and this fact implies a relationship—in mathematical terms a mapping function—between patterns on the skin and patterns in the viscera—between columns 2 and 4 in the table.

(5) A point known to western medicine (MacBurney's Point) as sensitive often in appendicitis.

What is significant is that this mapping function corresponds very closely to the relation between the path of a meridian on the skin and its own particular target organ (or target 'area' as it later became) given in Chinese texts. I am suggesting that the meridian system is conceptually valid in western terms, that it anticipates certain nerve/organ relationships discovered by Western Anatomy.

This may seem rather a roundabout way of saying that the influence of meridians on organs is a nervous one, and that it occurs down defined nervous pathways. But this is just the implication that, for the moment I want to avoid. In the next section, aspects of Acupuncture will be interpreted in such western terms: the necessary distortion entailed in this can be minimised only if we first have a clear conception of the system in its own right. For the Chinese, the meridians contained the ebb and flow of *chhi*—and it is sheer arrogance to say that what they were *really* observing were effects due to the nervous system. What we can say, significantly, is that flow of *chhi* shows similarities with our knowledge of the nervous system which indicates a common source for the two ideas, a common pattern of relationships within the body.

The deeper rationale beneath the two systems lies, I think, in embryological development. This is too big a subject to consider in detail here; but in essence what I mean is this. The strange, remarkable process of embryonic development evolves certain patterns of relationship between tissues in the mature body—patterns that determine the course of nerves and the details of nerve/organ relationships and which at the same time are mirrored in the Chinese system of meridians and target organs. Felix Mann's theories on the embryology of meridians reinforce this idea. He claims that of the twelve main meridians, four each are derived from Ectoderm, Mesoderm and Endoderm, and that the pattern of their distribution can be correlated with paths of embryonic cell migration.⁽⁶⁾ Such speculation provides a rationale in terms of total body organisation for the seemingly multi-level significance of meridians and their points.

III

A modern acupuncture text⁽⁷⁾ lists four effects that can be obtained by needling—depending on the point selected and technique used:—

(6) See "Acupuncture—Cure of many diseases" by Felix Mann.

(7) That of Cheng Danan, quoted in Dana Heroldová.

1) *Tonification*. "When the physiological function is weakened . . . stimulation can bring about tonification and restore function". We can now develop the implication made above and say that such a tonification (the word is significant) could be brought about by stimulation of the autonomic system via the peripheral nerves.(*) There are various effects known to the west which show a similar mechanism. For instance, pinching the skin over the face or neck can produce pupil dilation; irritation of the Phrenic Nerve (roots C₃ & C₄) causing hiccups can often be cured by stimulation of the skin over the shoulders (innervated by C₅ and C₆). Whether such effects could be active in a more general way is a matter for experimentation. The practice of meditation and variations on Yoga by the Chinese might have a confirming action here—since one of the main results of these disciplines is an increased control over the autonomic system.

2) *Reflex*. ". . . by stimulation of the contact points, the balance of the disturbed physiological function can be restored".

3) *Induction*. Patients are often needled both near the point of disease and at a remote point (this latter is induction). I will return to this later.

4) *Sedation*. "When the physiological function of some organ is over active, as in muscular cramps, nervous hypersensitivity, pain, inflammation, swelling, etc., long lasting strong stimulation is necessary to alleviate pain, suppress the inflammation and restore function". This action of sedation is very closely echoed by the most elegant theory of Acupuncture so far to appear. A recent theory of pain by Malzack and Wall (1970) sees the sensation of pain as the resolution of a dynamic interaction between various afferents to the spinal column—this interaction taking place in a 'pool' of inter-connecting neurones and interneurones. The afferents are these: two types of peripheral pain fibre (fast and slow), and descending fibres from other parts of the cord and the brain. In a painful stimulation, the fast fibres lower the pain 'threshold' and pain is felt but then impulses from the slow fibres, arriving later, counterbalance this effect by lowering the threshold—and there is normally adaption to the pain unless the pain stimulus continues. The descending fibres from the brain mediate the effect of states of mind upon the pain felt. It is postulated that Acupuncture needling stimulates

(8) Vogralik has suggested an alternative scheme whereby autonomic afferent fibres sent impulses to the brain stem and thus to parasympathetic or other nerve afferents. Mitchell in "The Autonomic Nervous System" states that such afferent fibres exist.

the slow fibres and thus gradually raises the pain threshold: echoing the words of the Chinese quotation. This theory has been used to explain Acupuncture's anaesthetic effects, which are by now of course well documented, e.g. Dr. James Fox in New York produced local anaesthesia for a tonsillectomy by needling in point Sanjian on the large intestine meridian—in accordance with traditional Chinese directions. Acupuncture anaesthesia has the disadvantage that it is not a muscle relaxant (a useful side effect of many anaesthetic drugs), and it cannot be used for some operations involving penetration of muscle—but a corresponding advantage in that vascular tone is not affected—and the patient is not as much in danger of succumbing to surgical shock as he is under drugs.

As for the original action of sedation quoted from Cheng Danan; such a model could account also for nervous hypersensitivity and muscular cramps (perhaps), but not inflammation or swelling. Other experiments claim to show that Acupuncture can affect the immune response, the Reticulo-Endothelial system, the Endocrine System and alter the E.E.C. (see Huard and Wong 'Chinese Medicine' p. 212).

Professor Wall has recently written in the *New Scientist* (July 20th 1972) concerning the application of his theory of pain to Acupuncture. He maintains that Acupuncture is "an effective use of Hypnosis" and that his theory of pain is not involved except perhaps at a very local level. A statement about his own theory of pain must be treated with respect, but the logic behind it is remarkable. His evidence is twofold: firstly that no scientists *he* knows have achieved the effect of pain blocking at a distance by stimulating peripheral nerves (there are many scientists whom he clearly doesn't know who have achieved just this effect—including Dr. Fox mentioned above). Secondly he presents this classically illogical syllogism: "the procedure is not used on children" (this is in fact not true—which of course converts the next statement into an argument *for* non-hypnotic Acupuncture): "children . . . are not open to hypnosis . . . (they) are not placebo reactors" : and, therefore, by inference, Acupuncture is hypnosis.

Wall is speculating and he admits it. He is also ignoring a large body of evidence as to the success of the treatment on people who cannot have undergone the long conditioning procedure which he envisages as affecting the Chinese. Moreover, at this point he seems to be using a familiar trick of scientists confronted with paradoxical phenomena—by changing the label from Acupuncture

to Hypnosis he can disregard it with an easy conscience as not a proper subject for the "art of the soluble".(*)

But Wall does not play the trick all the way; rather he goes on to say: "Acupuncture anaesthesia presents a fascinating challenge to the 'objectivity' of Western Science and its application to men. It challenges cultural, scientific, and political biases . . . If it turns out, as I suspect, to be largely a type of hypnosis, then we will have to ask if it is possible to increase the proportion of the susceptible population by an indoctrination programme."

I think that these are significant statements. They form a convenient turning point in the discussion—a turning outwards to consider Acupuncture as a force in the much wider philosophical context of medicine, and its relation to some other forms of treatment such as hypnosis and mesmerism. But this will be the subject of another article.

(9) T. S. Kuhn in "The Structure of Scientific Revolutions" argues that this manoeuvre has been of great significance in the historical development of science.

Reflections on the Zen Teachings of Huang Po

Derek Wright

If you WILL conceive of a Buddha, you will be obstructed by that Buddha.

From the evolutionary point of view it is a truism that man's most distinctive characteristic is the startling elaboration of his cognitive apparatus:— that is, his generalised sensory acuity or relative lack of genetically programmed perceptual selectivity, his enormous capacity for learning, his ability to represent his environment symbolically, to construct meaning in it and to recreate it, and his capacity to draw logically coercive inferences. Complex cognitive structures process input in terms of their own conceptual categories, guide action, and extrapolate beyond the real and given to the past, future, possible and impossible. These structures develop through childhood and adolescence under the influence of both maturation and the active interaction of the individual with his physical and social environment. The main stages of this development have been plotted by psychologists. One of the facts that has emerged, particularly from the work of Piaget, is that the basic features of cognitive functioning are discernible in their rudimentary form from a very early age and by later childhood have reached a high degree of articulation. For our purposes, three of these features deserve mention. The first is discrimination; the child learns to distinguish self from others, and one thing or person from another. The second is conservation. The self, objects and people continue to exist when not present and can retain their identity despite change in form. The third is relationship. Discriminated objects and people are seen to be related spatially, temporally, causally, and through classification, quantity, intention and so on.

Intrinsic to cognitive functioning is consciousness or awareness. The phenomenon of subliminal perception suggests that there can be cognition, in the sense of processing of sensory input, without awareness. But it seems inherently unlikely that there is ever awareness without some primitive element of cognitive discrimination; in any case it would be virtually impossible to establish the point. What does seem certain is that, insofar as we can talk about a

'function of awareness', this function develops and is strengthened precisely through that elaboration of cognitive structures which creates the universe we live in.

The cognitive apparatus does not function in isolation from the rest of the human system; man is not a computer. Affect and motive are indissolubly welded to cognition. Man's loves, hates, fears and values not only selectively motivate the cognitive apparatus but depend for their differentiation upon it. In other words, though conceptually distinguishable the autonomic and central nervous systems are in continuous, reciprocal interaction.

It is plausible to assume that awareness is identified with cognitive functioning throughout development, and that for most people most of the time this identification continues. One consequence is that what is immediately given in the present moment is more or less deeply shadowed by memory, knowledge, anticipation, purpose, and the like. Hence the commitments, the attachment and loss, the creativity and strife, the pleasure, happiness, alienation and despair which make up a man's life. It seems that with age a certain freshness of experience is too easily lost.

Yet always there have been people who have claimed that so long as awareness stays identified with the cognitive apparatus an important potential of the human system remains unrealised. It is, they say, possible for the function of awareness to grow beyond the limitations of the cognitive apparatus (which, like a scaffolding, has made its development possible), to transcend the discriminations upon which it is founded in some kind of vision of the unity of all things. If we are to trust report, and there are reasons why we should, spontaneous glimpses of such vision are not uncommon. Many of us experience fugitive 'spots of time' when an immediate and voiceless sense of the totality of things is felt. And many more might own to a restless claustrophobia generated by the limitations of the world they conceive and know. It may be that the natural process of committed living moves towards such vision. Certainly it seems that science in its more visionary aspects, art, and that community and personal encounter of which Buber speaks are all steps towards it. But it is the great religious traditions which, in addition to much that must surely frustrate its emergence, have maintained a continuing thread of concern to promote it. They contain attempts to communicate the vision, and prescriptions for practices and a way of life thought to facilitate it.

Insofar as awareness transcends cognitive functioning its quality

and content must for ever lie beyond the reach of assimilation by that functioning. Hence the constantly reiterated assertion that the vision itself is conceptually indescribable. Indeed, concepts like 'vision' and 'unity' themselves witness to the impotent striving of cognition after the impossible. Furthermore, from the vantage point of the cognitive apparatus itself, the vision is a *goal*, an end conceived and thought, and therefore discriminated from and placed alongside other goals. But if the vision cannot in fact be conceived it cannot be sought. Those who have reportedly spoken out of it make such paradoxical and confusing statements as that there is nowhere to go, nothing to seek, no one to do the seeking, and no enlightenment to be gained. There is the Buddha's much quoted remark: 'I truly attained nothing from complete and unexcelled enlightenment'. In the words of Huang Po, 'there is no pious practising, and no action of realising', 'even after aeons of diligent searching you will not be able to attain the Way', and 'let there be a silent understanding and no more'. It does not follow that because the vision cannot be found by searching (since the search is for an idea and the vision is inconceivable) that pursuit of the idea does not in some measure prepare the human system for a breakthrough into new awareness. Particularly is this so if in searching we constantly remember that it cannot be found. If we do not heed this repeated warning and remain identified with the search, the very concept of the goal will itself seal us off from ever awakening from it. But while we are identified with the cognitive apparatus we can only be reached through it. It is the Zen masters who have specialised in helping us out.

They have two basic strategies which have in common the same proximate goal. This is to 'silence' the cognitive apparatus; or more accurately, since this is strictly impossible, to bring about a temporary cessation of conscious thinking, remembering, evaluating, fantasising and the like. The point is that for people identified with such processes 'mental silence' can be the first steps in a loosening of the identification. It can prepare the way for unitive vision though it does not necessarily result in it. Indeed it may only result in a kind of stuporous state of consciousness which because it is felt as restful, refreshing and pleasant comes to be sought for its own sake. It is for this reason that some people, such as Krishnamurti, reject the proximate goal as at best an unnecessary and at worst a harmful diversion. But provided we remember that the cessation of thought is only a temporary expedient, a condition of waking

up not of living when awakened, then these objections lose much of their force. It was after their reported enlightenment that the great teachers did all their creative thinking.

The first strategy is meditation. In meditation the individual sits still and upright, with eyes closed or nearly closed, in a place that is silent and minimally distracting. This tends to reduce autonomic arousal and weaken the controlling influence of environment upon thinking while at the same time drowsiness and sleep are held at bay by moderate muscular tension. Then through the monotonous repetition of simple thoughts mental processes are slowed up until for longer or shorter periods they cease altogether and awareness floats free. It should be added that other traditions of meditation achieve comparable results not by monotonous repetition but through the art of watching mental processes as they occur.

The other strategy is teaching, though teaching of a rather special kind. It is as if the master deliberately manipulates the cognitive functioning of the pupil in order to disorientate and disrupt it so that it seizes up. The classic, stylized example of this is the koan. The pupil is given an insoluble intellectual problem and told to wrestle with it single mindedly until he finds the solution. If this is done seriously, there is apt to come a point when thinking jams up or stops through sheer exhaustion and there is a breakthrough into 'thoughtless' looking. In practice the success of this technique seems to depend upon the kind of relationship that exists between master and pupil. The pupil must believe in the master and really wrestle with the problem—it is no intellectual exercise. This implies a submission and docility on the pupil's part which is foreign to the western tradition of individuality.

But the same basic technique pervades all the classic Zen teaching, of which Huang Po's is a supreme example. He does not argue, reason, or persuade, for to do this would be to stay within the familiar limits of cognitive functioning and not help the individual to break through. Instead he assaults the mind with startling assertions, apparent contradictions, and paradoxes; and he makes use of such concepts as Mind, Buddha, Void, and Dharma which strain the grasping intellect to breaking point. Since the boundaries of such terms are so wide and their meaning so shadowy and elusive, the conceptual veil which on the Zen view comes between man and the unity of phenomena is stretched thin and one approaches close to conceptless looking. To reject such terms because they are empty of meaning is to miss the point that it is their emptiness

that makes them relevant to Huang Po's purpose; and to try to assimilate them by filling them out with analytic content, to rationalise them, is again to defeat his purpose by making them an opaque and soothing protection against the very waking up he seeks to induce. These terms are to be looked through, indeed climbed through, but not reasoned about. Of course for those people whose identification with the cognitive apparatus is unyielding, even an article of faith, they are irritating. But for others they may afford the first glimpses of an awareness unrestricted by discriminative concepts.

The unitive concept which Huang Po chooses to make most use of is Mind. 'All the Buddhas and all sentient beings are nothing but the One Mind'. But he does not mean that everything is mental, for that would be to fill the concept with meaning so that it ceased to be a window: 'Mind in itself is not mind, yet neither is it no-mind', and 'the ignorant eschew phenomena but not thought; the wise eschew thought but not phenomena'. Everything that is is now; there is nothing which is not now. The past and the future are mental representations in the now. Hence Mind is always now, and therefore 'is without beginning, unborn and indestructible'. Mind is not to be thought of as identical with phenomena, nor as distinguishable from them, such as their essence or origin, nor valued above them. 'Ordinary people look to their surroundings, while followers of the way look to Mind, but the true Dharma is to forget them both'. Talking of perceptual experience Huang Po says 'Only realise that though real Mind is expressed in these perceptions, it neither forms part of them nor is separate from them . . . do not keep them nor abandon them nor dwell in them nor cleave to them'. Speaking of 'our original Buddha-Nature' he says 'It is void, omnipresent, silent, pure; it is glorious and mysterious peaceful joy—and that is all. Enter deeply into it by awaking to it yourself. That which is before you is it, in its fullness, utterly complete.' And the route is simple: 'if you can only rid yourself of conceptual thought you will have accomplished everything'.

The most fundamental discrimination of the cognitive apparatus and the one on which it is founded, the basic invariant of the grammar of language and of action, is that between self and other, between subjective and objective, between 'I', 'me', 'mine', and 'you', 'they' and 'it'. Illumination in the Zen sense is centrally dependent upon the full and complete transcendence of this discrimination. Meditation can prepare the way in that it makes pos-

sible an awareness of ego-processes in which they are as 'objective' as externally perceived objects. But speaking out of the unitive vision Huang Po says that Mind 'is neither subjective nor objective, has no specific location, is formless and cannot vanish'. From the point of view of identification with the cognitive apparatus the disappearance of the self-other distinction is seen as the death of the ego and as such is feared: 'Men are afraid to forget their minds, fearing to fall through the Void with nothing to stay their fall. They do not know that the Void is not really void, but the realm of the real Dharma'. This moment of transcendence is 'the highest form of relinquishment', 'when everything inside and outside, bodily and mental, has been relinquished; when, as in the Void, no attachments are left; when all action is dictated purely by place and circumstance; when subjectivity and objectivity are forgotten'.

Though it is impossible for us to know the quality of an awareness no longer identified with ego processes without in some measure sharing it, we can nevertheless speculate upon its consequences for the functioning of the human system. Obviously the ego does not disappear since it represents an aspect of the structure of the system which has been acquired over many years; and in any case it seems likely that a coherent ego structure is a necessary part of the scaffolding which makes this further development in awareness possible. But presumably progressive modifications of the ego are set in motion. Reasoning, planning, decision making and action do not cease. What changes is the perspective within which they occur. They become situation centred and no longer biased by one narrow viewpoint within a situation. Ego protective and sustaining motives no longer have force in determining action, so that action itself can be put at the service of general values. Memory and knowledge are not lost; instead their role becomes more supplementary, less consciously dominant and less salient, and they no longer distract the individual from full awareness of his present situation. One might expect thinking to become more economical, pertinent, creative and realistic.

Taken in isolation, some of the sayings of the Zen masters (and Huang Po is no exception) could be construed as recommending a life of near total inactivity, wrapped in contemplation. But they themselves led very active lives. The real point of their message is that a great deal of human activity is wasteful and unproductive, and that in human relationships being a person of a certain sort can be more creative often than doing many things. Huang Po is

emphatic: 'I do *not* teach a doctrine of extinction! Few understand this, but those who do are the only ones to become Buddhas', and 'do not permit the events of your daily lives to bind you but never withdraw yourselves from them'. Daily life involves thinking; it is that 'your sole concern should be, as thought succeeds thought, to avoid clinging to any of them'.

A continuing theme of Buddhist literature is that enlightenment is the solution to the individual's own personal suffering, though in this context the concept of suffering is extended to include all negative states of mind such as fear and disappointment. Often enlightenment seems to be presented as an escape from suffering through withdrawal, disengagement, and the self-centred cultivation of tranquillity. But this interpretation does not fit with other elements of traditional teaching, and it is certainly incompatible with the whole spirit of Huang Po's message. To escape from suffering implies turning away from it, or believing it does not exist or is not what it seems, whereas Huang Po's constant exhortation is to look at what is, and to look directly and simply without thinking about it. It has been suggested that if we could learn to look at pain without thinking of it as ours, without rejecting it and trying to avoid it and without thinking what it might imply and without even labelling it as pain, but being simply aware of it as a phenomenon occurring, then we should find that its quality was different, that in a sense it was no longer pain. If this suggestion seems outrageous, we should remember that we are talking about levels of awareness which few people reach.

It would seem that at least a great deal of ordinary personal suffering has its roots in the identification of awareness with the cognitive apparatus, and particularly in the self-other distinction. Anxiety, grief, loss of status and material possession, the rejection of others, all imply an underlying sense of the isolated, alienated self set over against a world potentially threatening. When this very fundamental discrimination is so to speak undercut and embraced by an awareness of the total continuity of the self with the not-self there can be no alienation of the self, and the notions of attachment and loss begin to lose their meanings.

There is every reason to suppose that the unitive vision results in a subtle but radical transformation of personality. Most religious authorities have supposed that by imposing change upon the personality, by self discipline, the mortification of undesirable motives, and the scrupulous adherence to moral rules the attainment of the

unitive vision is somehow made easier. But when such discipline and moral rule following is ego-directed, as in fact it must be, it can serve only to strengthen the identification of awareness with ego processes. Huang Po will have none of it. He urges an immediate awakening now, so that personality changes can flow organically from it. 'A perception, sudden as blinking, that subject and object are one, will lead to a deeply mysterious wordless understanding; and by this understanding you will awake to the truth of Zen'.

For the individual person perhaps the most important fact about his life, and one which grows in salience with age, is that he will die. Numerous strategies have been developed for coping with this fact. The Christian tradition, at least in its popular form, does so by absolutising the self-other distinction through the belief that the individualised personality survives death as an eternal soul and ultimately as a resurrected 'spiritual body'. It would seem that commitment to such belief must finally prevent enlightenment. At a more homely level, and without such commitment, men grow towards reconciliation with the fact of their own death by, for example, coming to value their selves relatively little beside other things they value more, such as an ideal or the good of the collective; and when a man near the end of his life feels that he has done and given all he can, the sense of fulfillment must make the acceptance of dying easier. None of these resolutions is as radical as that of Zen, for each preserves as basic the sense of an individualised self. From the point of view of the unitive vision it seems that there can be no dying, for in a sense breaking into the vision is itself a kind of death. When the network of concepts centred on the self-other distinction, of which the idea of death is an intrinsic element, is seen as a cognitive construction which, however functionally useful, nevertheless obscures the more fundamental truth of seamless unity with the rest of the organic and inorganic universe there is nothing to die. If the individual person is a point at which the whole universe breaks into awareness of itself, there can be no separation from it. Men wrap themselves round with the fabric of belief and thereby trap their awareness within it. The message of Zen is that this defeats the full flowering of human development and leaves man twisting with frustration within a straightjacket of his own making.

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Intermediate Technology: a new approach to the problems of Developing Countries

Bob Congdon

**"If you want to go places, start from where you are.
If you are poor, start with something cheap.
If you are uneducated, start with something relatively simple.
If you live in a poor environment, and poverty makes markets small, start with something small.
If you are unemployed start using your labour power; because any productive use of it is better than letting it lie idle.
In other words, we must learn to recognize the boundaries of poverty.
A project that does not fit, educationally and organizationally, into the environment, will be an economic failure and a cause of disruption"**

E. F. Schumacher.

Experience has shown that despite the massive aid programmes of the past 20 years, the gap between the developed and the poorer countries has increased. The emphasis in the aid programmes has been on the provision of major industrial projects, steel, chemical and electrical power plant. A result of this policy has been the build up of western type industry in a few of the larger cities. One justification for such a policy is the experience in the west that capital is less effectively used when dispersed over numerous small projects. In fact these large developments have regrettably made little impact on the lives of the majority of the population who live in the rural areas. These latter areas are characterized by lack of development, mounting unemployment and a population drift to the cities. Such large industrial projects are not, of course, bad in themselves and what is needed is not an alternative but a complementary approach which encourages an improved standard of living for the majority of the population. As Dr. E. F. Schumacher has pointed out, what is required is the creation of more jobs where people are now living, in order to discourage migration to the towns. Such work places should be cheap so that they can be created in large numbers, should require only simple skills, use locally available materials and produce goods for local use.

In order to make a contribution towards solving this problem Dr. Schumacher and his colleagues, Mrs. Julia Porter and Mr. George McRobie set up The Intermediate Technology Group Limited in

1965. The objects of this non-profit group are to promote the collection and presentation of data on simple low-cost technologies.

What is intermediate technology?

The intermediate technology approach attempts to recognize the potential of a particular community and tries to enable them to develop in a gradual way. It is essentially rural based rather than urban based as is Western technology. One important feature of intermediate technology approach is the attempt to make more work places. The work place in the Western community will cost, typically £2,000 in terms of capital investment. This is clearly an impossibly high figure in a developing country which has little capital and even less foreign exchange with which to buy Western equipment. It does have a lot of labour even if the labour is untrained and unused to industry based on social grouping. One might therefore define intermediate technology as centering on the idea of job creation rather than job destruction. An example of the latter is given in an article by Keith Marsden of ILO. He describes a small industry in an African country engaged in production of sandals for local use. It was suggested that a cheaper product could be obtained by changing from the traditional material, leather, to plastic. The country therefore imported two plastic moulding machines at a cost of \$100,000. This highly automated plant operated very successfully but the net effect was to put 7,000 leather shoemakers out of work and in turn to reduce the incomes of the makers of leather, glue, thread, fabric linings, tacks, dressings, polishes, hand tools, wooden lasts and carton boxes whose livelihoods were connected with them. In their place were just 40 injection moulding machine operators who had to form new linkages with manufacturers of plastic machinery and PVC grains abroad because the local industry could not meet the new technological demands. The final outcome was a decline in domestic income and employment, an increase in the import bill for materials and equipment and a further expansion in the already rich technology exporting country.

Thus we see that it is extremely important to look at the full implications of any innovation. A proposal, however apparently worthwhile in itself, may well have repercussions on the local community which are detrimental rather than beneficial. An example in which local resources and skills have been utilized to satisfy local needs is found in the instrument workshop in a hospital in Nigeria.

Here hospital requirements from wheelchairs to saline solutions are being made from local materials with local labour. Designed for local conditions, rough concrete floors, high temperatures, they perform far more satisfactorily than imported equipment and, by eliminating the spare parts problem, the useful life is extended. But, most important, the cost is roughly half that of the imported equivalent and more Nigerians are in useful employment. This really is self-help and a good illustration of intermediate technology in action.

Intermediate technology is a dynamic approach to development in that as people become wealthier and more skilled they can both afford and use more complex and expensive equipment.

The intermediate technology concept goes beyond hardware and includes social institutions and techniques—ways in which people collaborate to achieve certain ends. It includes appropriate forms of education and training, health, research and development and, indeed, public administration as a whole. One aspect of public administration which requires particular attention if intermediate technology is to become widely diffused is the need for a regional approach to development such as is now being attempted in Tanzania. This extension of intermediate technology to forms of social organization is logical and essential. It is perhaps most clearly exemplified in the case of provision for health. So we see that the concept is not restricted to engineering.

The work of the Intermediate Technology Group

An early difficulty experienced by the Group was the lack of a convenient single source of information on available low cost equipment. To meet this need, a buyers' guide or directory called *Tools for Progress* has been compiled. This contains details of equipment with a maximum price of £100 FOB UK though most items were considerably cheaper. Glossaries are provided in French, Spanish and Arabic and over 7,000 copies of this guide have been distributed overseas.

Following publication of *Tools for Progress* the Group has built up a "clearing house" for enquiries on simple low cost equipment.

A number of (voluntary) expert panels have been set up on subjects of general interest to developing countries. The subjects include low cost ways of lifting and transporting water, low cost building techniques, low cost power, health, education and training, small industries and co-operatives.

The work of these groups, and of any projects that might arise

from them can for convenience be divided as between home and overseas. The home based part would tend first of all to concentrate on the documentation of existing techniques or appropriate equipment. Only then would it be worthwhile to establish a research project to investigate a piece of equipment or a technique to fill a 'gap' in the currently available range of alternatives. Overseas projects would be concerned with either a field survey to determine what the obstacles are that prevent people carrying out their current practices just a little more productively or efficiently, or they would be involved in trying to demonstrate the practicability of an 'intermediate' technique or equipment in order to show how it could be adopted and used on a wide scale throughout that region.

The whole effort can be considered as attempting to increase the range of alternative choices open to those in developing countries.

Some examples of intermediate technology

For about three years Reading University has had a considerable involvement in intermediate technology, most notably in the Department of Applied Physical Sciences, where work on the two following examples is being carried out.

The Humphrey Pump

At the beginning of this century H. A. Humphrey designed a radically new type of water pump. It was something of a sensation, and when the King George V reservoir was opened at Chingford in 1913, five of the Humphrey pumps were installed to pump water from the River Lea into the new reservoir. These pumps, still in working order, each day lifted 40 million gallons of water through 30 feet each.

The appeal of this pump is perhaps best shown by quoting from a sales brochure of the time:

"No rotary fly-wheel or crankshaft, no solid piston, connecting rod, bearings or glands are required. And again: "The thermal efficiency of the Humphrey pump is greater than has hitherto been reached by any other engine, because the operation follows a cycle in which the expansion of the burnt products is carried to atmospheric pressure."

It is these features, coupled with the fact that it seems to accept a wide range of fuels that make this pump particularly attractive for developing countries. At the time the manufacturers thought

it not too much of an exaggeration to say "The Humphrey pump constitutes the greatest advance ever made in pumping".

As part of his postgraduate work in the Department of Applied Physical Sciences, Nalin Walpita is studying this pump and considering its possible application in an intermediate technology context. The Humphrey Pump really does seem to have a new future. It is simple in construction, since it is built entirely of steel pipes, apart from a simple cylinder head comprising a toggle arrangement to operate the valves in the correct sequence and the provision of an ignition system. The pump will operate on methane which can readily be generated from animal dung. As an illustration, three cattle will provide the calorific equivalent of one gallon of diesel oil a day. The value of the dung for manure is not appreciably impaired.

Egg Trays for Africa

Turning now to a specific problem, a need has arisen in Zambia for means of packaging eggs for transporting from farms to central depots. The conventional solution is to form trays from paper pulp and pack these trays in crates. The trays are manufactured in much larger quantities than at present required in Zambia of 1.2 million per year and use expensive machinery. The requirement is for small, labour intensive production units each producing 1,000 egg trays a day. Four units would be required to meet the domestic requirements of Zambia. This problem was tackled by Thomas Kuby, a graduate of the Royal School of Art. His design has the merit of an interlocking construction which enables the stack to be self-supporting and eliminates the need for a packing case. Technically suitable raw materials are available in Zambia including wood, bamboo, elephant grass. It also appears that there is a very large supply of waste paper. Waste paper can readily be formed into a pulp using simple machinery and avoids the danger of possible contamination of the water supply which arises from the pulping processes used for pulping grasses.

The prototype machinery has been built in the Reading University's Instrument Workshops. The method that is used is to form a low consistency pulp on a mould fitted with a mesh screen. A vacuum pump is used to remove the water which leaves the paper fibres accumulated on the mould.

This machinery, complete with the necessary dryers, will cost about £8,000. It is a real alternative, insofar as the only other

commercially available plant costs about 20 times as much and produces about 15 times the number of egg trays needed.

Student Involvement

Universities and colleges are good examples of institutions having information and expertise (and the facilities for developing these) of direct relevance to developing countries.

Over the last couple of years there has been increasing pressure, often from students, to involve these places of higher learning more directly in finding practical solutions to real world problems. This led to the formation of I.T.D.G.'s Universities Liaison Unit. Its terms of reference are to stimulate knowledge in I.T. in general; and more particularly to suggest topics of research for undergraduates and postgraduates that have a direct bearing on the needs of the Third World.

In the six months that this unit has been in operation, it has made contact with around 50 universities and colleges. There are about 40 active research projects in hand—30 of them undergraduate and 10 postgraduate.

So far the projects are mostly in engineering departments—normally quite hard to get interested in Third World problems. One of the projects is a 'profile' on all the known methods of joining wood—lashings, glues, nails, screws etc., bringing for the first time all this information into one simple manual. Another is an attempt to classify the characteristics of traditional, 'primitive' pumps such as shadoufs and Persian wheels. Until now scientific concern has centred around 'sophisticated' devices like electrically driven centrifugal pumps. This project has already brought together for the first time details of nearly all the pumps at the lower end of the scale and eventually hopes to identify gaps in this range and fill them with appropriate new devices.

The University Liaison Unit's activities are expanding fast—at the moment it is preparing a new list of topics including ones in microbiology, architecture, chemistry, anthropology, and systems studies. It is hoped that this will not only extend the activity in I.T. but will also demonstrate ways in which educational attitudes can be stimulated to reflect a more direct technical and professional responsibility to the community.*

*More information about intermediate technology can be obtained from Intermediate Technology Development Group Ltd., 9 King Street, Covent Garden, London, W.C.2.

Comment: *Activity and Contemplation*

It has been said that each of us is either a man of contemplation or a man of action. Perhaps it would be more accurate to say that most of us lean one way or the other with a capacity slightly to change direction!

Contemplation here means pure speculation: the ability to look at things receptively without the desire to use or to change them. It is the realisation, in a philosophical sense, of *theoria*. Josef Pieper in his essay on "The Philosophical Act", throws enlightenment on this facet of *theoria*.

*"Theoria . . . requires a specific relation to the world, a relation prior to any conscious construction and foundation. We can only be theoretical in the full sense of the word (where it means a receptive vision untouched by the smallest intention to alter things, and even a complete readiness to make the will's consent or dissent dependent upon the reality we perceive through the recognition of which we give our yea or nay)—we can only be 'theoretical' in this undiluted sense, so long as the world is something other (and something more) than a field for human activity, its material, or even its raw material. We can only be 'theoretical' in the full sense of the word if we are able to look upon the world as the creation of an absolute spirit, as something which deserves our reverence. 'Pure theory', which is part of the essence of philosophy, can thrive only in such soil. And thus the freedom to philosophize and the act of philosophizing itself are made psychologically possible by an ultimate tie of the profoundest kind".**

Freedom for a more pellucid contemplation of persons and things demands reverence and self-discipline. Reverence heightens awareness of the outward creation and dispels the obscuring mists of self-preoccupation. Our perceptions are cleaned and objects seen and experienced with greater clarity.

We should be willing to let go our inhibiting anxieties. We need the courage to submit ourselves to the experience of confrontation: a willingness for exposure to new impressions: the mind's assent to suffer change without expectation of benefits.

A striving for pure contemplation seems always to have been the aim of art, religion and traditional philosophy. The difficulty is to step out of our narrow all-pervading daily activities into the serenity of contemplation.

The painter may long to be freed from the frame-work of pre-conceptions and to see and depict the wonder of a human face. The worshipper desires to participate in the solemnity of a catholic mass or to sense a presence in the quiet of a gathered quaker

* Josef Pieper: *Leisure the Basis of Culture* pp 83/84 (Collins Fontana Library 1965).

meeting. The philosopher may yearn for deeper insight and wisdom.

How do these endeavours and commendable aspirations help in the search for transmittable knowledge and material progress? The short answer is "Very little". Contemplation is concerned with the wonder of things, not with their immediate usefulness. It is a venture into new and mysterious territory and enlarges our personality. In becoming more whole we may also gain deeper insights into a meaningful mode of life.

Charles Kohler

Pathway
West Humble
Dorking

Sentences: *On Grief and Depression*

1. Henry Vaughan.

*They are all gone into the world of light!
And I alone sit ling'ring here;
Their very memory is fair and bright,
And my sad thoughts doth clear.*

*It glows and glitters in my cloudy breast
Like stars upon some gloomy grove,
Or those faint beams in which this hill is dress'd,
After the sun's remove.*

*I see them walking in an air of glory,
Whose light doth trample on my days:
My days, which are at best but dull and hoary,
Mere glimmering and decays.*

*O holy hope! and high humility,
High as the Heavens above!
These are your walks, and you have show'd them me
To kindle my cold love.*

*Dear, beauteous death! the Jewel of the Just,
Shining nowhere, but in the dark;
What mysteries do lie beyond thy dust;
Could man outlook that mark!*

*He that hath found some fledg'd bird's nest, may know
At first sight, if the bird be flown;
But what fair well, or grove he sings in now,
That is to him unknown.*

*And yet, as angels in some brighter dreams
Call to the soul, when man doth sleep:
So some strange thoughts transcend our wonted themes,
And into glory peep.*

*If a star were confin'd into a tomb
Her captive flames must needs burn there;
But when the hand that lock'd her up, gives room,
She'll shine through all the sphere.*

*O Father of eternal life, and all
Created glories under thee!
Resume thy spirit from this world of thrall
Into true liberty.*

*Either disperse these mists, which blot and fill
My perspective (still) as they pass,
Or else remove me hence unto that hill,
Where I shall need no glass.*

2. Sydney Smith.

Letter to Lady Georgiana Morpeth.*

Foston, February 16th, 1820.

Dear Lady Georgiana,

... Nobody has suffered more from low spirits than I have done—so I feel for you. 1st, Live as well as you dare. 2nd, Go into the shower-bath with a small quantity of water at a temperature low enough to give you a slight sensation of cold, 75° or 80°. 3rd, Amusing books. 4th, Short views of human life—not further than dinner or tea. 5th, Be as busy as you can. 6th, See as much as you can of those friends who respect and like you. 7th, And of those acquaintances who amuse you. 8th, Make no secret of low spirits to your friends, but talk of them freely—they are always worse for dignified concealment. 9th, Attend to the effects tea and coffee produce upon you. 10th, Compare your lot with that of other people. 11th, Don't expect too much from human life—a sorry business at the best. 12th, Avoid poetry, dramatic representations (except comedy), music, serious novels, melancholy sentimental people, and everything likely to excite feeling or emotion not ending in active benevolence. 13th, Do good, and endeavour to please everybody of every degree. 14th, Be as much as you can in the open air without

* *Letters of Sydney Smith*, ed. Nowell Smith Vol. I, no. 356 (Oxford 1953)

fatigue. 15th, Make the room where you commonly sit, gay and pleasant. 16th, Struggle by little and little against idleness. 17th, Don't be too severe upon yourself, or under-rate yourself, but do yourself justice. 18th, Keep good blazing fires. 19th, Be firm and constant in the exercise of rational religion. 20th, Believe me, dear Lady Georgiana,

*Very truly yours,
Sydney Smith.*

NOTES ON CONTRIBUTORS

Bernard Campbell is Professor of Anthropology in the University of California at Los Angeles, and he is training at the Primal Institute at Los Angeles.

Wendy Campbell is also training as a therapist under Dr. Arthur Janov at the Primal Institute, Los Angeles.

George Lyward, after 16 years as a schoolmaster, founded Finchden Manor, a community for seriously maladjusted older boys and young men of high or good intelligence, now in its 42nd year. He was at one time chairman of the Home and School Council of Great Britain and editor for 13 years of *Home and School*, and is a member of the Advisory Council of the Association of Psychotherapists.

The other participants in the discussion are members of the Editorial Board of *T. to T.* and notes on them have appeared in connection with their contributions to previous numbers.

Mary Glover, after reading Greats at Somerville, was a tutor at St. Hugh's College, Oxford. During the War she was seconded for service in industry. After the War she worked as a W.E.A. tutor and was director of Social Service training at the University of Keele under Lord Lindsay of Birker.

Jonathan Green took a mixture of arts and sciences at A level and has just finished his second year at Clare College, Cambridge studying medicine. He will be reading History and Philosophy of Science next year for his degree. Earlier this year he won the Beatson Prize for an essay on "Chinese Medicine—its thought and influence on the West".

Derek Wright read English at Oxford, psychology in the University of London and Education in the University of Birmingham. He has worked with maladjusted adolescents, and his special interests are in problems of attachment in children, moral judgments and religious attitudes. He is now a Senior Lecturer in Psychology in the University of Leicester, and is author of "The Psychology of Moral Behaviour" (Penguin) and co-author of "Introducing Psychology, an Experimental Approach".

Bob Congdon is a graduate of Loughborough University of Technology and is at present based on the Department of Applied Physical Sciences in the University of Reading, where he runs the Intermediate Technology Development Group's Universities Liaison Unit, which aims at making contact with specialists in universities and colleges in this country, and encouraging them to undertake intermediate technology research work. The unit has about 30 under-graduate and post-graduate projects in hand.

Timothy Grey Walter, who designed the cover, read Natural Science at King's College Cambridge from 1968-1971 and is now working at the Burden Neurological Institute in Bristol as Information Officer. His interests include painting Impressionist and Surrealist works, and meteorology.

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