THE LIMITATION OF THE NEUROSCIENTIFIC APPROACH TO PARAPSYCHOLOGY

PETER FENWICK

Introduction

A major difficulty for parapsychology is that it is considered a non-scientific discipline. Indeed, it is clear that if there was adequate scientific proof for the action of mind at a distance, together with the necessary mathematical theory to explain this, then physics as we know it would have to be re-written.

A search through the neuroscience journals for 1989 produced no articles on the nature of mind. Indeed, it is evident that the very nature of science as it is NOW understood would seem to exclude parapsychology as an area of study.

The Current Dilemma

Neurophysiologists and psychologists have long faced the problem that there appears to be no place in the brain for consciousness or mind—a fact which has led many scientists to claim that mind as a separate entity does not exist.

For many centuries there has seemed to be no place in the universe for consciousness. In the 18th century, when Newtonian mechanics appeared to give a complete account of the world, the mathematician Laplace said that if he knew the position and momentum of every particle in the universe, he could predict how the world would evolve. Clearly this statement assumed a totally materialistic universe, without consciousness, and evolving according to a set of immutable physical laws. The idea of a mechanical universe, although powerful in predicting the orbits of the planets, has been unsatisfactory from an experiential point of view, as it excludes consciousness. Both psychology and psychiatry suffer from the lack of a satisfactory theoretical framework for the explanation and investigation of consciousness. In order

to understand why, it is important to see how consciousness came to be excluded.

Primary and Secondary Qualities

In the 17th century, at the time of Copernicus, Keppler, Descartes, Galileo, Bacon, and Newton, to mention just a few of the outstanding thinkers of that time, the infant science of reductionism came into being. Up to that point, explanations of the external world had depended on the views of Aristotle and other Greek authorities. What the new science did was to propose models of the world which could be checked and were in accordance with observation of physical data. The success of the scientific method gave rise to the modern reductionist science we know today. Galileo in "The Assayer" (1623) said:

> To excite in us tastes, odors, and sounds, I believe that nothing is required in external bodies except shapes, numbers, and slow or rapid movements. I think that if ears, tongues, and noises were removed, shapes and numbers and motions would remain, but not odors or tastes or sounds. The latter, I believe are nothing more than names when separated from living beings, just as tickling and titillation are nothing but names in the absence of such things as noses and armpits.

He stated that science was only concerned with primary qualities, those qualities of the external world which could be weighed and measured. Secondary qualities, heaviness, beauty, love etc. were not within the realm of science.

Descartes expressed the same idea of the difference between primary and secondary qualities. He maintained that there are two radically different kinds of substances, physical, extended substance (res extensa) that is, that which has length, breadth and depth, and can therefore be measured and divided, and thinking substance (res cogitans) which is unextended and indivisible. The external world, of which the human body is a part, belongs to the first category, while the internal world of the mind belongs to the second.

It was these assumptions by the early scientists that led to a division between subjective and objective worlds and to the exclusion of consciousness (subjective experience), by definition, from the external world. If the external world is only to consist of those things which can be weighed, measured, and quantified, then by definition it must be "a valueless exterior," with no place for consciousness. However com-

plex physical theory becomes, consciousness will not appear in the equations. (It can't, because it has already been excluded.)

The Search for Consciousness

With the rise in the 19th century of experimental physiology, and the understanding that the brain was responsible for the appearance of consciousness it was hoped that the examination of brain structure and physiology would give us an understanding of the nature of consciousness. By the end of the 19th century, it became clear that neurophysiology was unlikely to yield any information about the nature of consciousness, although it might well give some information about its mechanism. It would be possible to cite numerous examples from many authors who wrote widely on this subject at that time, but it is sufficient to quote from Charles Sherrington's essays Man and his Nature, which were published at that time, and which sum up then current thinking.

> You may then ask whether it is one cell, a superpontifical cell, which allows the world to come into consciousness, or whether it is many. The brain acts as a democracy, with each cell playing its own place, and through their concerted efforts they allow consciousness to arise.

He described this process poetically as the workings of the enchanted loom. "They weave an ever-changing pattern, never an abiding pattern, the workings of the enchanted loom."

> Sherrington was at as much of a loss to explain consciousness as his predecessors were: The energy scheme describes a star, how the light from a star strikes the retina, and stimulates the cells in the back of the eye. From there, nervous conduction carries the information to the brain where it is distributed amongst the cells of the cortex. But at the point at which the star comes into consciousness, the energy scheme is silent, and puts its finger to its lips.

It was hoped that further neurophysiological investigation would somehow still be able to extract the true nature of consciousness, if only it could be made complex enough. That this was unlikely to occur was shown by the school of thought typified by Gilbert Ryle in his essays on man, when he points out the futility of the search for "the ghost in the machine."

Twentieth Century Physics

Twentieth century physics brought the recognition that the universal mechanical laws of Newton must give way to the laws of relativity for the very large, and to the statistical laws of quantum mechanics for the very small. Once again there was hope that consciousness could be found lurking in the corner of our mechanical universe. Recent work by such physicists as David Bohm heightened these expectations. During the 60s and early 70s, with the big bang theory still in its theoretical infancy, it seemed possible that the conditions in the first few seconds of the universe had to be so precisely chosen if the universe was to evolve in the way that it has done, that these conditions could not have occurred by chance. It was also postulated that as the conditions at the time immediately preceding the expansion of the universe could never be known (technically this is known as a singularity), the possibility of a consciousness and a consciously-directed universe still existed. This led to the idea of the anthropic principle, a principle that states that the evolution of man's consciousness must have been written into the laws of physics from the beginning, simply because he is here to observe it. The logical extension of this was the assumption of an implicate unfolding order which becomes manifest during the evolution of physical laws.

Closing the Gaps

However, in the most modern theories of physics it seems that even these gaps which seemed to allow for consciousness have been closed. There are now perfectly coherent theories which suggest that it is possible to know the physical laws pertaining to the initial singularity of the universe, and that the universe evolved the way it did because it was the most probable of the set of all possible universes. And so once again, consciousness has become excluded. We can no longer appeal to the "God of the Gaps" as modern physical theory does not really leave any gaps to be filled.

This does however, clearly run contrary to everyday experience. We know that we live in a universe where love, beauty, sadness, are part of our experience. And even if the physicists cannot find a place for consciousness it has still to be reckoned with.

So then, why is it that physics is still deficient, in that it gives us a mathematically coherent and highly effective predictor of the outside world, but yet leaves aside some of the most important aspects of that world—color, beauty, love, etc? In order to understand this, it is nec-

essary to look at the very basic assumptions on which our reductionist science is built, as it must be from there that its incompleteness stems. Remember, the primary qualities of Galileo excluded subjectivity, so the data of science is objective. But scientific observation is carried out by scientists and they are subjective, so how can science be totally objective? Our modern understanding of brain function may help to explain this paradox, although the following scheme must be dependent on the assumptions of reductionist science and contaminated by them.

Explaining the Paradox

The external world comes into consciousness through the mind/brain mechanism. Although we experience the outside world as a series of sensory objects, what actually comes to our senses is energy in the form of electromagnetic radiation of different frequencies, very low frequencies for hearing and touch, higher frequencies for warmth, and higher still for vision. These radiations carry no subjective information and have only objective value. As Sherrington said, they are part of the energy scheme. Modern physics would describe them simply as heaps of statistical probabilities.

These radiations trigger neural codes, which are made by the brain into a model of the external world. This model is then given subjective value and by a trick of brain functioning projected outwards to form the subjective world. We call this external world objective, whether we are looking at the meters which monitor the occurrence of resonances in high energy particle accelerators (the data of quantum mechanics), or the ricochetting of two billiard balls (the data of Newtonian mechanics), but it is only a subjective mental model created within our brains. As the nuclear physicist Wigner said, "When we stare at our meters, we merely see reflections of ourselves."

The result of this distorted worldview, is that it appears that reductionist science is capable of explaining our mental models which have value and quality and consciousness, while at the same time covertly saying that value, quality and consciousness are excluded from them. So our scientific models must lead to theories which are devoid of consciousness by definition.

Scientific models of brain function can only explain subjective experience as a mechanical process; anger as an activation of neural impulses in amygdala-hypothalamic structures; love as activity in those neurological systems which underpin mood; transcendent experiences, when the world is experienced as universal love, as the dysfunction of the temporal lobe. Scientists would argue that if we were to understand

brain function fully then consciousness could be totally explained by a moving flux of electro/chemical processes within the brain. Even the synthesis of new qualities arising from complexity of brain structure as in the models of artificial intelligence, still makes use of scientific thinking, and so still excludes consciousness. Reductionist science still assumes an external world which is independent of ourselves, but uses a subjectively contaminated mental model to assess it.

A Science of Secondary Qualities

Although psychology has not yet developed to the science of Galileo's secondary qualities, physics has already begun to recognize that the objective and subjective cannot be separated. Some theorists of quantum mechanics include the observer in the observation, for example, where a particle appears is dependent on the collapse of the wave equations which specify it. Until they collapse, the position of the particle cannot be precisely predicted. Thus, observer and observation are intimately related.

Is it possible to evolve a science of secondary qualities and of consciousness so that reductionist psychology need no longer explain phenomena beyond its terms of reference? And if so what consequences would this have for psychiatry and psychology?

Both Galileo and Descartes pointed the way to this science when they split off the objective world from the subjective. The study of secondary qualities must be the science of subjective experience. The aim of such "Secondary Psychology," or "New Dualism" should be the analysis of consciousness and its content. It takes as its data only subjective experiences, is consistent within itself, and sets up theoretical models about subjective experience. It sets out to explain the relationship between different subjective phenomena, as reductionist science does for the objective. This science progresses as does reductionist science, by the setting up of a hypothesis, its testing, possible falsification, and reformulation. In this sense it is a true science, as defined by Popper.

Before the nature of the new dualism can be determined the laws of mind and consciousness must be defined. This can only be done by the detailed observation of subjective experience with the evolution of a coherent schema of the properties of mind and consciousness. This suggests that much work of psychology at the turn of the century could again become valid, though viewed from a different perspective as it is now only concerned with consciousness, not with the structure or function of the brain, which are in the domain of reductionist science. It is to be expected that the study of our everyday consciousness would

give one set of rules, just as the study of our everyday world does in physics. These rules would change when the level of consciousness altered just as they do in physics when the scale alters from the very large to the very small. Under this scheme transcendent and mystical experience, both spontaneous and induced by special circumstances, such as near-death experiences, would be seen as valid descriptions of the world. Consciousness is then seen as the ground structure of the universe from which all else arises, study of these experiential states would lead to a more complete understanding of the universe and the rules that govern it. These two views, one through the primary qualities (physics) and the other through the secondary qualities (subjective experience) might then be related to make a unified whole.

Brain Function and Parapsychological Experience

Dr. Vernon Neppe has already written in a previous conference proceeding concerning the relationship between experiences arising from disorders of the temporal lobe, and parapsychological phenomena. This view, which attributes parapsychological phenomena to the functioning of the temporal lobe, runs into the difficulties of mind/body dualism. Providing that as has already been explained above, science by definition is unable to explain consciousness, then the relationship between brain function and experience is a valid field for study. However, the relationships are correlative, and cannot be causative. Fenwick (1983) looks in some detail at the relationship between brain physiology and mystical experience.

In a study of psychic sensitivity and mystical experience, head injury and brain pathology, Fenwick, Galliano, Coate, Rippere, and Brown (1985) were able to show that temporal lobe pathology was possibly involved in patients who had experienced psychic gifts. Their hypothesis came from the parapsychological literature in which it is often mentioned that there is a relationship between head injury and a subsequent development of psychic sensitivity. This observation allows the development of the hypotheses which say that the experiencing of psychic gifts is due to temporal lobe damage, or is due to an alteration of function in the temporal lobes such that brain function is altered and allows a new manifestation of consciousness to arise. These two hypotheses are not seen as alternative by science, as a similar alteration in brain function is postulated in both hypotheses, the difference between them being that in the second case, mind is seen as acting through brain rather than being a distillation of brain function.

The Significance of Temporal Lobe to Psychic Experience

The findings of this study showed that there was a significantly larger number of head injuries in the group who claimed psychic sensitivity experiences. It was interesting that on psychological testing this group showed a significant excess of brain damage compared to the control group, and that this damage was confined to the right hemisphere and was maximal in the right temporal lobe. As a result the mediums experienced some specific cognitive deficits. For example, most of the mediums when in trance had "psychic helpers." These helpers frequently manifested in physical space and tended to stand on either one side or the other of the mediums. Those mediums with right temporal damage and right hemisphere damage could be expected to show poor visio-spatial abilities and thus poor spatial localization of their helpers. This was exactly what we found. Mediums with brain damage described their helpers as being "all around" rather than having a special spatial location. This finding adds support to the hypothesis that mediumistic experiences are specifically conditioned by brain function.

Another finding of this study was that the mediums had more mystical experiences than the controls. This finding would suggest that mystical experiences are to some extent mediated by the right temporal lobe, and indeed, there is evidence in the literature that this is so. A paper by Cirignotta et al. (1980) describes a mystical experience occurring during an epileptic aura (fit). The seizure arose in the right temporal lobe. Additional evidence comes from the author's own experience in which patients with epilepsy who have had mystical experiences have usually had right temporal lesions. That the right temporal lobe should be involved is not surprising, as there is evidence in the literature that the right temporal structures are involved with the mediation of emotion.

There was a relationship between the type of psychic sensitivity and right temporal lobe impairment. Precognition, clairaudience, telepathy, working with a psychic helper, having a psychic guide, and the position in physical space of the psychic helper, were all significantly related to right hemisphere damage. This finding clearly suggests that brain damage can lead to these experiences.

The mediums were more "fragile" than their controls. They had had more serious illnesses, had been knocked out more often, had had more blackouts, and had consulted a psychiatrist more frequently. This suggests not only an increase in physical damage to the brain, but possibly emotional damage as well. A questionnaire study of patients with epilepsy at the Maudsley hospital showed that there was a definite re-

lationship between perinatal brain damage and the experience of telepathy and clairvoyance. This was found in not only those with temporal lobe epilepsy, but also in those with generalized seizures. Again this finding suggests a relationship between long-standing brain damage and the occurrence of psychic experiences.

Unhappiness and Illness in Childhood

Kenneth Ring, an American psychologist, in a paper given at an international conference in Norway described the provisional results of a recent study he has undertaken into near-death experiences. Not everybody who has a cardiac arrest and comes close to death, has a classical near death experience. Many people coming out of the intensive care unit will have experienced only unconsciousness. Comparing those who did to those who did not have the near death experience, Ring found that there was a significant difference in their childhood experiences. Those who described near death experiences had been more unhappy in childhood or had had more childhood illnesses. This finding suggests again the possible causative role in these experiences of brain trauma as well as the significance of emotional deprivation. It is possible to hypothesize that during the development of the mature mind, both brain damage and emotional deprivation allow the formation of different psychic structures which mediate and underpin parapsychological experiences. The question that then arises is whether or not these experiences reflect an extension of reality or whether they are simply part of a dysfunctional brain?

Conclusion

Science today, following the postulates of Descartes and Galileo, studies only the objective external world. Subjective experience is thus excluded from scientific study, with the result that parapsychological knowledge cannot be reconciled with the large field of scientific knowledge. With the recognition of the present limitation of scientific theory, a new science based entirely on subjective experience, will need to be created. It will be a combination of objective and subjective sciences, that will finally lead to a resolution of the current separation of psychology and parapsychology.

The study of brain function allows us to gain some understanding of factors which are important in the genesis of mystical and parapsychological experiences. It is clear that the right temporal lobe is predominantly involved, and that an alteration of function within this area

can give rise to aspects of psychic sensitive experiences as well as mystical experiences. Further work needs to be done on the possible relationship between childhood unhappiness and stress, and the hypothesis that this may facilitate creation of psychic structures which in adulthood can mediate a range of experiences which are not available to those with normal childhoods.

Present orthodox science still has much more to contribute, although a more comprehensive explanation of these phenomena will only be achieved with the fusing of the sciences of objective and subjective experience.

REFERENCES

Cirignotta, et al. (1980). Temporal lobe epilepsy with ecstatic seizures. *Epilepsia, 21,* 705–710.

Fenwick, P. (1983). Some aspects of the physiology of the experience. In J. Nicholson & B. Floss (Eds.) *Psychology surveys* No. 4. Leicester: British Psychological Society.

Fenwick, P., Galliano, S., Coate, M. A., Rippers, V., & Brown, D. (1985). Sensitives, "psychic gifts," psychic sensitivity and brain pathology. *British Journal of Medical Psychology, 58,* 35–44.

Neppe, V. (1986) Window into the mind: A phenomenological perspective. In B. Shapin & L. Coly (Eds.), *Parapsychology and human nature* (pp. 1–12). New York: Parapsychology Foundation.

Ring, K. (1989). Personal communication. Data presented at the Near-Death Experience Conference, Floro, Norway.

DISCUSSION

HARARY: It is just not true that people who have a lot of subjective psi experiences necessarily have something wrong with them, have had bizarre childhoods that led to their having those experiences, are necessarily brain damaged, or have suffered from severe emotional problems. If we are looking for pathology whenever somebody says they have had a psi experience then we have totally alienated ourselves from our own potential. We have said, "Look, all you crazy people experience this stuff—not the rest of us." Well, I have had a lot of psi experiences. I have had electrodes hung all over me and I am fine, thank you. I really think that this expresses part of the problem. I mean, look, we can talk about people who have serious problems and discuss how they may either feel that they are having certain kinds of experiences of psi or that they are not. But the point is there are people who have serious problems who think they are encountering something that they are not. Just as there are people without serious problems in the same situation. There are also people who have serious problems who think

they are encountering something that they are! There also are people who do not have serious problems who think they are experiencing something and they really are. They really do what they say they do and no, they do not go into fits; they do not have horrific head injuries; they do not have brain damage. Sometimes people have difficult childhoods because they are experiencing things that the people around them do not feel comfortable with. That does not mean that the difficult childhood created the experience, it may be the other way around. Also often the psi experience is a response that is healthy, that helps you cope, that gives you a sense of something greater, something beyond yourself, something to reach for, some sense that the future is going to be brighter. So what are you suggesting? Should we turn this off? Should we imply that only pathological people, only people with real serious problems, experience psi? I do not think so. No offense but I have never smelled non-existent perfume and there is no epilepsy in my family. I think it is OK to talk about what happens in pathological situations but we must not confuse what happens in pathological situations with what happens in normal situations. There has to be a normal context for psi.

FENWICK: I am talking about three sets of data. These are very specific sets of data. One is a set of mediums who came to me from the College of Psychic Studies in London. Another set are patients who have got epilepsy and therefore brain damage. The third set is a set of people provided by Kenneth Ring, who is a psychologist in the United States who researches into near death experiences. Now, within that population of people there seemed to be a very close correlation between the occurrence of some experience, for example, a birth trauma or a head injury, and the onset of that psychic gift. It would be quite unfair to generalize outside that population and I would not like to do it. If you want an explanation of the phenomena, I think you have to be very careful about what model you are using. If you use a reductionist model, in other words, the perception of the world as we see it is entirely due to brain function, then you will come out with reductionist explanations. The explanations which I put forward at that time, that this was due to a distortion in the temporal lobe structures, would be a perfectly logical model and quite consistent with the data which was presented. However, you may find that that is not a satisfactory model. In other words, if you come to think of the world as it is and how it comes into our consciousness, science is quite unable to explain even the most simple sensory experiences. We know a lot about the actual mechanism. It is all related to the energy scheme. When I say energy scheme I'm also talking about the transfer of information because the

two are interchangeable. We come to a point where sensory experience arises. Now, there is not one theory that I know of which talks about how the magnetic fields and the ionic flow within neuronal networks leads to the arising of sensory experience. You can talk, if you like, about parallelism, but that really is just avoiding the issue. We have no scientific theory of the nature of ordinary experience, very simple things. There is quite a good reductionist explanation for the phenomena that I was describing. But, whether that is the entire explanation, and whether you find it satisfactory, really depends on the philosophical point from which you come. But, if you will always imply a scientific frame, then you always will end up with brain function. I'm not sure really that in a conference devoted to parapsychology that we should always be looking at scientific models. I think we actually should be examining other models as well.

NEPPE: Let me just from a continuity point of view carry on where Dr. Harary has left off, I think his points about attribution of causality are obviously very important. If one examines a population of people with psychopathology you may well get one subpopulation who is able to attribute a variety of different phenomena in terms of just answering, "Yes, this has happened to me." That same subgroup may be answering in relation to subjective paranormal experiences or might be talking about them, and might also be prepared to talk about traumatic events in their childhood. Attribution of causality is questionable. Even if one then gets a control group from a psychiatric population, you may find that the (proper) correlation will stand up but it does not imply any kind of causal link. So I think Keith's point is particularly good. I also want to clarify that I have been misquoted by Peter in this paper. To quote him quoting my view: "This view which attributes parapsychological phenomena to the functioning of the temporal lobe runs into the difficulties of mind/body dualism." I have never attributed parapsychological phenomena to the functioning of the temporal lobe. I have said there is a correlation between subjective paranormal experience and anomalous temporal lobe functioning as reflected by the increased incidence of possible temporal lobe symptoms both at a state and a trait level and also incidentally linked up from an electrophysiologic point of view in terms of another study on electroencephalograms. The electroencephalographic study, originally by Nelson, is really the only positive one that has not been replicated. There was a marked degree of interhemispheric asychrony but it was equally distributed on both sides. In our subsequent studies using the same lab, we found several people with subjective paranormal experiences as having normal electroencephalograms. I am interested in the point

made in relation to olfactory hallucinations because I have no doubt that you would fit the criterion in terms of our subjective paranormal experience. Although I have not gone through that formally with you, we now have about 18 subjects, all of whom had spontaneously, when asked about olfactory hallucinations, admitted to it. Keith, you are the very first "psychic" I have ever come across who has not spoken about that. We have not been looking for family histories of seizures until very recently. We did find that cluster in one family and it has been an interesting one which crops up with my temporal lobe epileptics all the time. But again one is looking at a pathologic population. There is just one final comment which may allow clarity to all of this. A very interesting finding in relation to temporal lobe pathology has been that the accentuation of stress and emotionality that is linked with all of this may in fact, in some kind of vicious cycle component, seem to be accentuating the temporal lobe pathology in some way. I would like to emphasize the very important point that I talk about anomalous temporal lobe functioning. I do not talk about dysfunction of the temporal lobe in people with subjective paranormal experiences: the temporal lobe is functioning in a way that is different from that of the average member of the population. They have certain perceptual experiences of temporal lobe kind which others do not have. This does not imply temporal lobe dysfunction. In fact they function differently to temporal lobe dysfunctions as well because as indicated, the olfactory hallucinations, and the deja vu experiences are qualitatively different; they are not the same.

FENWICK: Yes, I accept that absolutely. I think that is very nice. Going back to the head injury question, the argument runs something like this—if people show psychic experience after they have had head injuries, you can take either a reductionist view that you so change brain function that the meaning which is attributed to experience, is altered, or a non-reductionist view. This would say that the brain function is changed in such a way that the mediation of experience is different. Those are two quite different statements about the world and I think one has to see this.

PARKER: Rather like incest, perinatal brain damage and perinatal risk factors have been found to be correlated with a wide range of psychiatric disorders. I do not think one can imply much from the thought that they are a risk factor in life.

NEPPE: Birth is correlated with many psychiatric disorders.

VAN DE CASTLE: I am finding myself distressed in some ways because I feel the panelists are going toward trying to make an extremely strong linkage between psi and pathology. As I tried to address yesterday, my

own view would be that psi is somehow growth facilitative. If so, it can certainly be an accompaniment of normal behavior or of a psychiatric problem. If we were to link psi with creativity, we could have an equally eloquent panel talking about creativity and referring to some artists and writers who would have been labeled as schizophrenic or manic depressive. Would we come to a conclusion that we should get rid of creativity because somehow it means you are going to wind up psychotic if you are creative? Certainly you can be normal and appreciate creativity. If psi is intended for self-enhancement, self-expansion, self-understanding, we should find more models, more research paradigms that could emphasize that. I was trying to explain yesterday, you can experience psi in this cooperative fashion with all members participating, feeling good about having had a joint psi experience. It seems to me we have too much pathological focus and too many nosological categories. It will distress Vernon Neppe that he has not been able to get Keith Harary into one of those pigeon holes yet and he is going to try until he gets him into one of those diagnostic pigeonholes. Are we going to go on with this labeling and categorizing and seeking out, smelling out? Do you smell perfume? Because then I have got you tagged and this somehow is a negative aspect in connection with psi. So if we could somehow see that psi is here for a reason—it is to facilitate growth and people with mental problems are going to need additional growth. I would also hope that all of us, as normals, would not want to exclude ourselves from seeking the possible experience to grow, and to be creative, and to have some sort of interactive exchange with others or with information that we feel is some sort of an enlargement of our own personal worldview.

WEST: Dr. Neppe has mentioned to us earlier that some surveys have shown, that actually the majority of people report some kind of subjective psychic experience during their lives. Now, unless the temporal lobe anomalies are much commoner than I believe them to be, the correlation between these two things cannot be as high as has been suggested.

NEPPE: This is almost a direct question in relation to this and I think it is very important to make the point, as I have made it, that I subdivided my populations, and one would have to look at the original research methodology in this regard, into people with large, large numbers of subjective paranormal experiences using a variety of validating criteria at that subjective level using three levels of descriptive interview as I indicated. That was an extreme subpopulation compared with the other subpopulation of "non-experients." However, separately, the vast majority of the population reports subjective paranormal ex-

periences but they have small numbers in their lifetime. They do not fit within the framework of anomalous temporal lobe functioning. It is only the extreme subgroups that one is talking about in terms of that. In the criteria that I have used, the people who have never had experiences, who are incidentally at times, depending on the population you look at, as hard to find as those who had large numbers, have had four different kinds of subjective paranormal experience. So your point is an important one and it is a point that I have made repeatedly. The average member of the population has these experiences, but they do not have any evidence for anomalous temporal lobe functioning. If they did, that temporal lobe functioning would not be anomalous.

ELLISON: May I just reinforce what Peter Fenwick has been saying about the importance of models (and what that end of the table has also been saying), how one is limited in the experiments one does, and what one will find in those experiments, by the model used. I mentioned earlier that I have recommended for many years, with no success at all, that fellow psychical researchers experiment on themselves. I experimented on myself and had two out-of-body experiences. Now, the way I did that was to change my conceptual model. I had to imagine that I had an astral body made of subtle material interpenetrating the physical—which is not quite "true." In other words, it doesn't fit realism at all, which is very easy to show in simple experiments. But I had to go along with that model before I could possibly "move my consciousness around in the physical world." I did what the Philip group did. I "believed" in the model and then had as a result of strong imagination an OBE. It couldn't have been 100% belief, of course, because I knew it wasn't true in my ordinary model of reality. I had enough belief in that model to have success. I moved around physical space in an astral body and had very interesting experiences indeed. So, it's enormously important to have the right models and I'm sure Bob Van de Castle has a much wider range of interesting, creative, and stimulating experiences because he has a quite different model. Regarding Peter Fenwick's head injury cases, I asked him a question about that some time ago. I read some of the old Hindu literature and in Patanjali's Yoga's aphorisms the idea is given there that if you practice meditation then you will develop the *siddhis* or psychic powers. So, I wondered, if you practiced meditation—in other words, developed yourself—whether you could "rewire" your right temporal lobe? (I'm an electrical engineer) I asked Peter Fenwick whether this was possible and he told me it was. He might like to comment on that. Finally, another experience with Peter: we set up an EEG machine in a bio-electricity lab in our university. He asked me, as the first guinea pig, to relax while he

observed my EEG. I didn't understand and I said, "Do you want me to relax thinking or not thinking?" He told me he had never been asked that question before, so I switched off my thinking. (Having been a long time meditator I was able to do that.) We got rather a lot of theta rhythm, about the four hertz region. I had that interesting experience. Somewhat concerned Peter also examined my whole EEG picture; and I had a statement to say that I am normal.

FENWICK: Only just normal, Arthur. Concerning the comment about changing your model of the world by meditation, one of the things we do know is that you can change brain rhythms by meditation and there is some evidence from the biofeedback literature that if you change your cerebral rhythms in one circumstance, you can change them in another. The correlation between EEG and mental state is a very distant one, but nevertheless, what you are arguing for is a change in cerebral physiology due to a practice of some sort. I think this would absolutely agree with what we think, in other words, the mental state that we bring to a situation determines what we see. I suspect it's got a neurophysiological basis as well.

CASSIRER: Let me be unfair to Dr. Fenwick for a few seconds. You made your experiments with mediums from the College of Psychic Studies in London, and you found a correlation between brain damage and those mediums. I, however, was thinking of the great mediums of the past: D. D. Home, Mrs. Osborne Leonard, Mrs. Piper, and so on. I have never heard of any suggestion that they were dropped on their heads as babies or that they suffered from any of these physical abnormalities. Would you care to comment?

FENWICK: I wouldn't interpret anything outside my data. Within that set of data head injuries or cerebral trauma were important. Within Ring's data of people who had near-death experiences and people who did not, then the people who had near-death experiences had either unhappy childhoods or prenatal brain damage. Those were only three very small studies and to try to explain the whole phenomenon just on three studies, I think would be quite unfair. So, I very much accept what you say. There are bound to be people who have these experiences without any evidence of brain damage at all, and indeed this would fit much better into a model of the world, than one which says that all these phenomena are just due to brain damage. I wouldn't say that.