Preface

There are two fundamental problems in science and philosophy. One is whether all the sciences including biology and the neurosciences can be reduced to physics. The other is the nature of our conscious experiences, and their relationships to events in our brains. Are they to be identified with these brain events, being merely an aspect of them as given to the 'owner' of the brain? Or have they an independent world of existence, being in correspondence with brain events, or at least some brain events?

The program of the radical materialists is to reduce all sciences to physics and to reduce conscious experiences to the science of brain states and hence to physics. Thus everything would be reduced to properties of matter. Their efforts to deny or to ignore conscious experiences have collapsed because of its intrinsic absurdity. Hence materialists, both radical and 'tender-minded', accord conscious experiences a ghostly recognition as appendages or properties of brain states. Essentially the same philosophical doctrine masquerades under a variety of names: epiphenomenalism, parallelism, the double aspect theory, the identity theory or the psycho-physical theory of Feigl, Pepper, Smart and Armstrong and the theory of biperspectivism of Laszlo; but it is more subtle and sophisticated in its most recent forms.

The most important exponent is Feigl, who for over forty years has built up the identity theory in such a flexible and appealing manner that it has achieved a wide acceptance not only amongst philosophers, but also amongst neuroscientists. In fact one can say that it has a special appeal to neuroscientists because it gives them assurance that the brain states they are investigating are all that matters in the performance of the brain. They can proceed with their scientific investigations on the brain just as on any other material object without having to be bothered with the possibility

of disturbance by non-material mental states. In fact all scientists are materialists and reductionists methodologically. The difference is that some of us, including myself, have a contrasting philosophy of anti-reductionism. We do not subscribe to the tremendous extrapolation from our present level of scientific investigation and understanding that is required by philosophical reductionism as expounded for example by identity theorists. This apparent conflict between our scientific methods and our philosophy becomes sharpened for those of us who are scientifically engaged in studying the highest levels of the brain – the human cerebral cortex in conscious subjects, as is for example done by Penfield and by Sperry. Both of these distinguished scientists have developed philosophies in which consciousness is given a dominant role in modifying brain states, which is a dualist-interactionist concept comparable with that developed by Polten.

This brief introduction will justify my statement that this book by Eric Polten is on the most important problem confronting man, namely the relationships of his conscious experiences to the events in his brain. It is a problem that I have wrestled with since adolescence. Its challenge motivated me to become a brain scientist, going to Oxford to work under Sherrington. But I also have continued to study the various philosophical solutions of the body-mind problem or brain-mind problem as it should be called. The rest of the body is recognized as being merely ancillary to the brain. I was early attracted by the brain-mind dualism and interactionism of Descartes, though of course updating it and greatly modifying it in the light of modern neuroscience. I was encouraged to discover that leading neuroscientists such as Sherrington, Adrian and Penfield were dualists, but discouraged by the failure of so many philosophers even to understand the brain-mind problem as it could be seen by a neuroscientist. Meanwhile I had discovered that Popper was also a dualist and interactionist, and gradually there was a change in the philosophical climate of opinion from the nadir represented by Ryle's destructive criticism of the 'mind concept' which he completely rejected in his book *The Concept of Mind.*

It is remarkable that in the original version of this manuscript Polten makes very few references to Popper and none to me! The many references to us both occurred after a lucky accident of discovery, though the main text and arguments were not changed. The circumstances are so extraordinary that they are worth recounting. At the request of a philosophical

friend behind the 'iron curtain' Mr. Polten's father had instructed a bookseller to dispatch to him a number of books, including my book *Facing Reality*. It so happened that this latter book was mistakenly sent to Mr. Polten's father along with the invoice, so he glanced through it, and discovered to his amazement how close his son and I were in our respective philosophies. This case of mutual recognition required such a lucky chance though we had lived for years as close as Toronto and Buffalo!

I was sent the manuscript and we have met on two occasions for long discussions. What enthuses me about this book is that it represents on the positive side a dualism and interactionism very close to the philosophy that I had independently developed. Furthermore, I particularly liked the clear exposition of the three components of the world of conscious experience: outer sense, inner sense and pure ego. This is an important contribution, not so much for its novelty as for its range of development, and it has a good scientific base in modern developments in the brain sciences. We need this clear and imaginative thinking in order to reduce the diversity of conscious experiences to meaningful order. Polten illuminates the concept of pure ego by reintroducing the Kantian word 'apperception.' Pure ego does not perceive itself, the recognition is due to apperception.

Of course a theory of dualism entails the problem of interaction. How can mental events and brain states interact? The failure of dualists, including myself, to give any precise explanation of the postulated interaction has led to the denial of dualism. My view is that brain science is at too primitive a level to allow more than speculations that cannot at present be tested adequately. For the same reason there is no satisfactory account of interactionism in this book. Yet the denial of interactionism means the denial of free will, as both Polten and I will agree. We have to learn to live with problems beyond our present understanding, and not impulsively to deny either the existence or the reality of such problems. As I read many philosophical writings I am led to believe that the learned authors must at all costs propose a nice tidy theory. Feigl is an exception in that he dares to live provisionally with 'nomological danglers' as he calls them!

I agree with Polten that in criticizing the psycho-physical identity theory he should concentrate on the philosophical arguments and concepts of Feigl, who is its most distinguished advocate. To my knowledge this book embodies the most comprehensive and sustained attack on this important theory. To give point to the criticisms there is a wealth of quotations from Feigl's writings. In this way the reader is kept informed

of the points under attack. It is impressive that Polten illustrates and supports his argument from a wide range of distinguished philosophers right back to the pre-Socratics. He thus displays his affiliation with the long stream of philosophers from Aristotle to Kant, Whitehead and Popper.

It could be objected that the intensity of critical attack is not in good academic taste. But it has to be recognized that this disputation is deeply motivated. Is not the theme under consideration the most important for man, reaching to his fundamental nature? If Feigl is right, then man is no more than a superior animal, entirely a product of the chance and necessity of evolution. His conscious experiences, even those of the most transcendent creative and artistic character, are *nothing but* the products of special states of the neural machinery of his brain, itself a product of evolution. If Polten is right, man has in addition a supernatural component, his conscious self that is centered on his pure ego. Thus with his spiritual nature he transcends the evolutionary origin of his body and brain, and in so far could participate in immortality.

But at a more mundane level there is in this disputation a fundamental issue for man. Has he free will or is it an illusion? By taking thought can he bring about changes in his brain states? As a neurophysiologist I must insist that, if our belief in our free will is valid, our thoughts must be able actually to effect changes in the activities of the neural machinery in certain special regions of the cerebrum – that is there must be an effective mind-brain action. If Feigl is right, this cannot be true in reality, only in appearance. We may feel that we are bringing about actions in accord with our conscious desires, but these feelings are themselves nothing more than brain states, so free will is reduced to some brain states bringing about other brain states, which is purely a neurophysiological happening explicable completely in materialist terms. We are caught in a deterministic bind. As MacKay reasons, we are right then to think we are freely willing; whereas an external observer can fully account for all actions at a deterministic level. On the contrary, as expounded by Polten, it is of the essence of dualism that mind does effectively act on the neural machinery of the brain in willing, which is precisely the position of the distinguished neurophysiologist, Sperry. Of course it is still recognized by both Polten, Sperry and me that by far the greater part of our actions are determined by neural operations alone. Thus the disputation of this book is vitally concerned in establishing that freedom of action is not an illusion, but

that on the contrary we have in varying degrees freedom to choose between genuine alternatives of action and in so far are responsible for our actions.

Specially to be commended in this book is the author's clear understanding of the causal theory of perception. There is often amongst philosophers a misunderstanding of the problems presented by perception because they are not cognizant of the neurophysiological events concerned in perception and the vital role that learning plays in all perceptual experiences. Furthermore, there are interesting developments when perception is considered in relation to the concepts of outer sense and inner sense.

Every aspect and every detail of the psycho-physical identity theory of Feigl has been subjected to close scrutiny in this book. In section after section Polten claims to have refuted this theory in a whole series of philosophically based arguments. These sections are specially directed at the philosophers concerned, and demand answers. From this challenge and these answers new levels of understanding should arise.

I like to think that philosophers will at last realize that they cannot effectively engage on disputation in the field of brain and mind unless they become experts in the brain sciences. I am appalled by the naiveté of concepts and of programs that are suggested, for example the cerebroscope and auto-cerebroscope of Feigl and Pepper. Of course there is always the covering phrase 'in principle', but it is pure fantasy that some instrument could provide a meaningful 'picture' of the events in a brain at the time of some conscious experience. At a conservative estimate, even for the simplest perception, each of tens of millions of neurones would be engaged in patterns of impulse discharges, the whole ensemble having unimaginable complexities in space and time. In our present understanding meaningful activities occur when clusters, probably of tens or hundreds of neurones, are in collusive operation with discharges above or below the noise level of the incessant background discharges. This pattern in space and time is 'written' by sequential synaptic actions of neurone to neurone each stage occupying only about one thousandth of a second. Thus the whole assemblage of neurones engaged in some evolving pattern has a dynamic complexity beyond instrumental display at any time into the foreseeable future. The attempts to correlate electroencephalographic records (the EEG) with moods are necessarily at a crude level because the EEG is merely an averaged record of field potentials generated in some unknown way by millions of neurones. It is time for the cerebroscope and

auto-cerebroscope to be relegated forever to the world of science fiction.

When Mr. Polten kindly invited me to write this Preface he recognized that I was critical of several sections of his manuscript and invited me to expound these criticisms in my Preface. I think it inappropriate to engage in such criticisms in the Preface. It is sufficient for me to note that for me the positive achievements in this manuscript far outweigh the defects. The book as it stands is a record of the intellectual achievements of Mr. Polten with I gather no significant help from his supposed mentors in the University of Toronto. He has built this conceptual edifice during years of intensive study ranging over the whole history of philosophy. No doubt, as with all conceptual edifices, there will be reconstructions of parts, but it is my belief that it represents a very important contribution in that it so strongly challenges the last tenable philosophical position of the materialist monists.

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