Hornell Hart

(1888-1967) Received his Ph.D. degree from the State University of Iowa in 1921, and for nineteen years he was Professor of Sociology at Duke University, North Carolina. During this period he also served on the Advisory Board of *The Journal of Parapsychology*, and in this capacity worked in close association with Dr. J. B. Rhine. Held a number of other important university posts, and wrote several major books on social and psychological problems. Coined the term "super-ESP" in 1959. Also coined the term "ESP projection" and contributed articles for several leading parapsychological journals.

Can Consciousness Survive Destruction of the Brain?

- Hornell Hart -

Do the Known Facts About the Brain Disprove Survival?

Gardner Murphy stated the question in 1945
IN HIS brilliant summary of 'Difficulties Confronting the Survival Hypothesis', Gardner Murphy wrote:

> 'The nervous system, becoming ever more complex in the service of [integrating different bodily activities] ceases to be simply a basis for action, and becomes the basis for awareness of outer and inner changes....
>
> Moreover, the *specific parts* of the brain mediate the specific qualities of experience. Let the surgeon expose part of the brain in a patient under local anesthesia, probing electrically here and there; he may elicit in the patient specific experiences of warmth, cold, touch, by stimulating those regions which have long (on anatomical grounds) been assigned to the mediation of these same experiences of warmth, cold, touch. Injury, moreover, to specific regions of the brain may obliterate the capacity to experience the corresponding warmth, cold, or touch sensations, just as injuries to the auditory or visual centres may cause disturbance, or even loss, of auditory or visual experience. (This specificity of localization is much finer in man than in the lower mammals.) It is difficult to think of any conscious process except in terms of the total dynamic adaptive process thus mediated by the nervous system. The biological point of view makes it difficult to think of *any aspect of awareness* as continuing independently of the very substratum which has given it its place in nature.'

Richet had raised the issue in 1923
In discussing 'the difficulty of survival from the scientific point of view', Charles Richet had said:

> 'For myself, without being able to give a firm demonstration (for one cannot prove a [universal] negative), I cannot believe that memory can exist without the anatomical and physiological integrity of the brain. Whenever there is no more oxygen, whenever the temperature is either too low or too high, when there are a few drops of atropine or morphine or choloroform introduced into the blood, whenever the course of cerebral irrigation is stopped - memory alters and disappears. Spiritists cannot deny these facts.'

Dodds quoted Broad on the subject
In explaining his own disbelief in survival, in 1934, E. R. Dodds cited approvingly the following statement which Dr. C. D. Broad had made in 1925:

> 'The view that the mind is existentially dependent on the organism and on nothing else is compatible with all the normal facts, and is positively suggested by them, though they do not necessitate it. And it is the simplest possible view to take. The theory that the mind merely uses the body as an instrument is difficult to reconcile with the normal facts.'

Rhine restated the same point
More recently than any of the above, Dr. J. B. Rhine said, on 8 December, 1957:

> 'The concept of an indivisible mind-body unity has almost, if not quite completely, been substituted for the older picture of a separable spirit that could do at least something in its own right, even with its body returned to the soil of the earth.
>
> Therefore any scientific theory of survival today would appear to have a fantastically greater set of odds against it, in the mind of the average scientist, than it had a hundred years ago.'

Clarifying the Issue

Can one's essential selfhood function consciously apart from its physiological brain?
That question states the crux of the issue, but it requires to be cleared up in two further respects:

(1) What is the 'essential selfhood'?

I find it a good rule to endeavour to base all my thinking on such propositions as I cannot deny without reasserting them (by implication) in the very denial. One basic proposition of this sort is the statement 'I am conscious'. If I say to myself, 'I am not conscious,' the immediate retort which arises in my mind is: 'Says who?' To deny my own consciousness I have to assert it. My essential selfhood consists in whatever it is that is referred to by the subject of the verbs 'I observe', and 'I act'.

That this is not a mere personal peculiarity on my part seems evident from the fact that at least everyone who is sane keeps using the pronoun 'I' with considerable frequency. Even the three groups who are trying to eliminate the term 'consciousness' from scientific discussion (the behaviourists, the behaviouristic operationists, and the logical positivists) keep referring to themselves by the pronoun 'I', and they keep using this pronoun to assert or imply that they are either observing, or acting, or both. The essential self, then, is the 'I'-thinking observer-operator.

(2) What is the meaning of 'to function consciously'?

In certain cities, if you wish to know what time it is, or if you wish to know what is the weather prediction for the next day, you dial an appropriate number and you then hear a recorded voice giving you the desired information. From the artificial satellites which have been thrown into orbit around the earth recently, scientists have been able to obtain, by radio, coded information about what is the temperature at the point in space through which the satellite is passing, or how intense are the cosmic rays, or how fast the heart of the dog or the mouse in the satellite is beating. How do such messages differ from a telephone conversation in which questions are answered and plans for future co-operation are worked out? The live transmission differs from the mechanical recording in that conscious functioning is originating the message at the very time that it is being received. What that actually means is that something which thinks 'I' is at the other end the message.

Three theories about how the mind is related to the brain
The main issue of this chapter really boils down to a choice between the following:

(1) *The Mechanistic Theory* holds that the brain is a kind of complicated recording device, with elaborate switches to combine the recordings in various ways, and to produce appropriate outgoing nerve-currents. Consciousness, according to this theory, is merely incidental, like the light which accompanies the burning of wax in a candle-wick. When the burning is put out, the light instantly ceases.

(2) *The Psychosomatic Theory* holds that consciousness and brain activities are merely two inseparable sides of one reality. This brain-mind combination is not merely mechanical (like a tape-recorder) nor even merely biological. It is psychological in the fullest sense. But when the brain aspect ceases, the mind aspect (according to this theory) must also cease, because brain and mind are merely two different ways of looking at the same process.

(3) *The Transmission Theory* holds that the 'I' is a separable, self-existent reality, which uses the brain somewhat as a pianist uses a piano, or somewhat as the TV actor uses the television set.

Now, according to either the mechanistic or the psychosomatic theory, the 'I'-thinker is created by the brain, and is dependent in every detail on the brain's correspondingly detailed structure and functioning. Hence, under either of these theories, survival beyond bodily death would be impossible. But under the transmission theory, survival would be not only conceivable but a fairly obvious expectation.

Is the Brain an Intricate Recording and Calculating Machine?

Reducing the question to concrete terms
How does the brain help a person to adjust to the outer world? For example, suppose that you are attending a football game in a stadium which you have never visited before. You have parked your car, among a maze of others, beside a main highway. After the game, you are trying to get out and start home. You see a moving mosaic of colours and shapes; you hear a blare of horns, whistles and shouts. Your brain has the job of translating these stimuli into a series of muscular actions, applied to the steering wheel and to other parts of your car, such as will bring you safely into the stream of traffic which is going your way. How does the brain do it?

The crucial test would appear to be minute localisation
If the brain were merely an intricate machine, one might suppose that experience had set up innumerable tiny circuits in the neurons, each of which might be set off by a suitable nerve stimulus. For instance, there would be a brain pattern corresponding to your seeing and hearing a policeman beckoning and blowing his whistle. When you recognized that pattern, it would set off muscular habit patterns which would move your foot from the brake pedal to the accelerator. Now, if a man's brain actually worked in that way, what would happen to him if a piece of shrapnel dug a channel through those millions of nerve circuits in his head, or if a surgeon's knife cut through them to remove a tumour? If the man lived, and if the remaining parts of his brain still worked, it might be expected that innumerable, quite specific reactions would no longer be possible for him, while others, whose patterns had not been destroyed by the shrapnel, would still operate as before.

Some established facts about brain localization
As far back as 1861 Broca proved by autopsy that a small area of destruction in an otherwise normal brain had produced loss of ability to speak without loss of other abilities. A few years later experimenters showed that an electrode, placed at a certain point on the brain of a dog caused one leg alone to move. Subsequent exploration showed that there is a visual, an auditory, and a voluntary motor area on each side of the cortex.

Penfield's discovery
Dr. Wilder Penfield, Director of the Montreal Neurological Institute, is one of the world's leading authorities on epilepsy. For decades he has been curing this affliction, in many of the cases which come to him, by cutting out of the patient's brain the diseased area from which electric surges had been producing convulsions. To find the diseased area, he opens up the skull and places an electrode at various points on the surface of the brain. In 1955 he reported that doing this to the temporal lobe cortex sometimes produced a psychical response:

> 'The patient might exclaim in sudden surprise that he heard music, or that he heard a well-known person speaking, or that he saw something he had seen before, or that he was himself taking part in a former experience in which he was himself an actor.
>
> At such times the patient continued to be aware of the fact that he lay upon the operating table, and yet the recollection continued in spite of himself, as long as the electrode was kept in place, to vanish instantly when the electrode was withdrawn. These examples may be given.
>
> A young woman heard music when a certain point in the superior surfaces of the temporal cortex was stimulated. She said she heard an orchestra playing a song. The same song was forced into her consciousness over and over again by restimulation of the same spot. It progressed from verse to chorus at what must have been the tempo of the orchestra when she had heard it playing thus. She was quite sure each time that someone had turned on a gramophone in the operating room.
>
> A South African who was being operated upon cried out in great surprise that he heard his cousin talking, and he explained that he seemed to be there laughing with him although he knew he was really in the operating room in Montreal.
>
> There were many other examples of hearing music but always the patient heard a singing voice or a piano, or an organ, or an orchestra, and sometimes he seemed to be present in the room or in church where he had heard it. What he heard in experience was a single occasion recalled to him with a vividness that was much greater than anything he could summon voluntarily by efforts of his will...
>
> In summary it may be said that the electrode, applied to the temporal cortex, recalls specific occasions or events so that the individual is made aware of everything to which he was paying attention during a specific interval of time...
>
> I must conclude that there are in this area permanent records of these experiences preserved somehow in the form of ganglionic patterns that can be reactivated by the electrical impulses delivered to the cortex by the operator's electrode.
>
> It may be assumed then that in this area of cortex each successive conscious experience is laid down in a relatively permanent pattern of nerve-cell connections that records all those things of which a man is conscious at any given time. It is as though the cortex contained a continuous strip of cinematographc film, a strip that includes a waking record from childhood onward...'

Commenting further on this discovery, in a lecture published in 1958, Penfield said:

> 'One must conclude that there is, hidden away in the brain, a record of the stream of consciousness. It seems to hold the detail of that stream as laid down in each man's conscious hours... the record of this stream, as we have brought it to light with the stimulating electrodes, might better be compared to the sequence on a wire recorder or to a continuous film strip with sound track ... so that the record can be replayed at a later time... But this remains a supposition.
>
> No constructive thinking is produced. No willed or purposeful behaviour... The ganglionic record of past experience must ... be at a distance from that area of temporal cortex. But the key to unlock the past is to be found there and apparently only there.'

The mechanistic interpretation
In lecture after lecture, and in article after article, Penfield has used the wire-recorder figure of speech in explaining his discovery. Now a wire-recorder is about the most extreme illustration which could be used of a purely mechanical recording of the results of human thought-processes. If the brain were a structure made up entirely of such mechanical recordings, with complex but automatic switches between circuits, then the minutely detailed dependence of consciousness upon brain structure would seem amply to justify the objections raised by Murphy, Richet, Broad, Dodds, Rhine, and others. Damage to brain areas would then produce corresponding damages to the processes of consciousness, and the destruction of the brain at physical death would (under such conditions) seem to be quite certain to mean the extinction of the personality which had been generated by that brain. But does Penfield's discovery justify such a conclusion?

Penfield himself disavowed it
In the group discussion which followed Penfield's presentation in a symposium held in Canada in August 1953, Dr. D. O. Hebb made this comment:

> 'It is very difficult to conceive of memory as a function of a localized region. Thus the distinctive effects of stimulation of the temporal lobe may reflect a special arrangement of fibres within it, rather than showing that memory is resident here and not elsewhere. "Memory" surely comprises all lasting modification of neural function resulting from earlier activity of the cells concerned, and it seems inevitable that the frontal and parietal lobes are also concerned...'

To this objection Dr. Penfield replied:

> 'I wish Dr. Hebb would teach me what terminology to use so as to avoid the accusation that I believe in a punctuate or a compartmental representation of consciousness!'

He denied extreme localization
In 1958 Penfield called attention to the fact that the brain acts as a whole. He said:

> 'It should be remembered that function can never be limited to a locus. Therefore, strictly speaking, it can never be localized. Each area of the cortex, for example, is capable of making some specialized contribution to one of the many functions of the brain. No cortical area can act by itself. Each functional unit is normally integrated into the action of the whole.'

Dr. Penfield's hypothesis runs away from his data
In spite of the above interchange with Dr. Hebb, Dr. Penfield continued to use the 'wire-recorder' figure of speech to represent the memory record as he believed he had uncovered it by his explorations with his electrode. He has stressed repeatedly the conception that every item of conscious experience is strung consecutively on the time line of the individual's mental life, and that this sequence is all recorded in detail in these brain patterns.

But pause for a moment to consider what this implies. Consciousness in a person's brain is more continuous than the succession of frames in a moving picture. If we regard human consciousness as registering 16 frames a second (as is standard in movies), this would mean that during a lifetime of 15 hours per day for 50 years there would be more than 10 trillion (10,000 million) such frames recorded in a given man's memory. Each of these frames would have to record intricate complexities of visual, auditory and other sensory experience. These 10 trillion intricate memory frames would all (according to Penfield's theory) be recorded in a mass of grey matter small enough to be held in the palm of one's hand. And yet, from this almost inconceivably complex and compact 'cinematographic' record, with the relatively gross and crude electrodes such as a surgeon might apply with the naked eye, Penfield has claimed to be able to hit repeatedly on the same 'frame' and to bring back the same chain of vivid memories.

The memory traces are not arranged mechanically
If Dr. Penfield had uncovered, in the human brain, anything really corresponding to a wire-recorder, the experiences on the individual's time line would be arranged consecutively in the order of the events as they actually occurred. But this is not what Dr. Penfield has reported. He said, in 1958:

> 'A certain stimulus at approximately the same point [in the brain], if not too long delayed, is apt to reproduce the same experience, beginning at the same moment of time...
>
> If restimulation of the same point does not reactivate the same strip of time, it is apt to produce an experience that is similar in content of subject...'

For example, a woman patient, when a certain point in her brain was touched, heard a mother calling her little boy. Then, points short distances away from the original one were stimulated. She reported that she heard voices 'down along the river' and that she saw the river. Then, eleven minutes after the first stimulation, the original point was again touched with the electrode. The patient no longer heard the mother calling her little boy. Instead she heard the voices of people calling from building to building. In this series of recalled experiences, some dated back at least ten years earlier than some of the others, and yet the element of calling voices was common to all of the experiences.

In another case, a patient heard the same song vividly when each of four different points in his brain was stimulated. In other words, such examples as these show that a given memory pattern is not necessarily tied in with a given stimulus-point in the brain, and that the sequences of these episodes is related to other kinds of association rather than merely chronological order.

Penfield's case where the brain was an instrument used by the 'I'-thinker
The Penfield findings which have just been cited have a *negative* bearing on the mechanistic hypothesis. They all point to the conclusion that the brain does *not* act like a mechanical recording and switching device.

But one of Penfield's most highly significant findings (for our purposes) is *positive* in character. It points to the conclusion that the brain *does* act like a transmitting instrument, used by the 'I'-thinker. Consider in that respect the following:

In his lecture delivered before the National Academy of Science in 1957, Penfield said:

> 'If the electrode is applied to one of the speech areas of the dominant hemisphere ... the patient is silent... He no longer can find words to express his thoughts. But they come with a rush when the electrode is lifted and he says, then, the things he was trying to say while the electrode was interfering with his employment of the speech area of cortex.'

The 'he' in the above passage appears to refer to the observing and operating 'I'-thinker.

Other Recent Evidence About Brain Localization

In the light of the facts brought out above, let us now go back to the problem of how the driver gets his car through the traffic after the football game. Would damage to a given local area of his brain eliminate the specific memories and skills which he needs in order to get home?

Penfield has not offered evidence that cutting out a given section of the temporal lobe cortex would eliminate a given memory of the past. He did show, in 1958, that when a certain area on both sides of the brain was damaged, *recent* memories were lost. But more distant events could still be recalled quite well. Hence the damaged part of the brain would have to be regarded - not as a permanent tape-recording, but rather as a sort of current file, in which recent memories resided for a while and then were filed back into areas for more permanent memories.

Since Penfield failed to show minute localization, what findings have other recent researches produced on this point?

Recent rigorous experiments do not show such localization
Morrow and Mark, in 1955, gave mental tests to 22 brain-damaged patients, in comparison with 22 psychiatric patients and with 45 'normal' persons. They found that 'there were no significant differences involving the vocabulary, information and comprehension scores'. The brain-damaged patients were inferior to the psychiatric ones in general I.Q. and in arithmetic scores. Their digit-symbol scores were less than half as good as those of the psychiatric patients. Yet Walstead noted, in 1951, that 'a maximal adult I.Q. for the [Stanford-Binet] scale is possible with about one-third of the total cerebrum lacking'.

When intelligence is impaired by brain injury, the reductions in mental efficiency are not the result of the destruction of specific memories and skills. Walstead remarked, in 1951: '... we have thus far seen no close relationship between the cellular components of the brain and discrete units of behaviour...' Klebanoff, Singer and Wilensky reported in 1954, on the basis of a comprehensive review of the literature, that 'in general, psychological instruments have proven incapable of differentiating patients with presumptive injury to specific cortical areas'. Vraa-Jensen, in 1955, after studying 'cerebral changes in certain presenile and senile psychoses', concluded that 'it is extremely difficult to demonstrate a relationship between structural changes and given morbid features of psychic condition'.

Moreover, functions performed by one part of the brain may be shifted to another part. Back in 1912, Yerkes found that habits registered in one specific structure of the nervous system of an earthworm might shift later on, and become dependent on another specific structure. That similar versatility is to be found in human brains is suggested by the findings of Klebanoff, Singer and Wilensky in 1954, relative to the effects of brain damage in children. They reported that injuries which would produce long-lasting psychological damage in adults may be corrected by compensatory development of function when the injury occurs in the brain structure of a young child.

In the light of such facts, Whyte, in 1954, offered this 'hypothesis about brain modifications underlying memory'.

> 'Memory processes are not identified with a cell assembly, neural circuit, synaptic pattern or any other arrangement of cell surfaces. The functional element in memory is a continuous three-dimensional mass of cortical cytoplasm that acts as a volume conductor.'

The electric-field theory of the brain has been invalidated
While it is no longer possible, in the light of laboratory evidence, to hold the simple, mechanistic conception of specific cell combinations being the seat of specific psychological elements, some psychologists have, instead, proposed electrical-field theories of brain processes. But Lashley demolished a leading theory of this sort, in 1951. The following is an abstract of his article:

> 'The theory of cerebral integration of molar patterns of electrical current flow was tested by placing a grid of strips of gold foil in contact with the visual cortex and by thrusting gold pins through the cortex in the macular area of monkeys. A variety of tests failed to reveal any disturbances of visual function resulting from either of these procedures. As applied, the metallic conductors should have produced marked alterations in the pattern of current flow within the cortex. The author concluded:
>
>> "In the absence of any direct evidence in support of the electrical field theory of cerebral organization, of the logical difficulties in its application ... and of the complete absence of visual symptoms following the placing of metallic conductors ... the conclusion seems justified that the action of electric currents, as postulated by the field theory, is not an important factor in cerebral integration."'

Try this experiment - and explain it
A simple experiment was suggested by Lashley in 1951. Try it yourself. Raise your eyes from this book and look at the upper right-hand corner of the room where you are sitting. Then let your eyes move slowly down to the lower left-hand corner. Now move your eyes up and down as your vision traverses the room from left to right.

Did the room seem to move as you moved your eyes? Of course not! Yet the light patterns were shifting constantly on the cells of your retinas, and the electro-chemical impulses were changing complexly in your optic nerves and in the visual area of your brain. By what conceivable mechanical process could this steady image of of the room be produced from these complexly shifting cellular activities? Lashley summarized as follows:

> 'A visual object maintains its continuity in spite of constant fluctuation in the position of the eyes and shifts in its position on the retina...
>
> Such facts lead me to believe that theories of neuron activity must be couched, not in terms of the action of individual cells but in terms of mass relations among the cells. Even the simplest bit of behaviour requires the integrated action of millions of cells.'

A non-materialistic finding about apoplectic strokes
Damage to brain cells in a stroke produces very obvious psychological symptoms, such as inability to speak, and the paralysis of other parts of the body. Yet Dr. Howard A. Rusk, in 1958, reported a striking non-materialistic conclusion from studies of the histories of 257 patients. He reported that there appeared to be no correlation between the severity of a stroke and the degree of recovery by the patient. The important factors in rehabilitation, he indicated, are the feeling of being wanted and loved, and of having a home or a job to which to return.

What About the Psychosomatic Theory?

The mechanistic theory may be regarded as fairly well disposed of by the above considerations. But what about the theory that consciousness and brain action are merely two ways of looking at the same indivisible process? This theory would hold that whenever a conscious mental process occurs there must be a corresponding brain process, and hence that the consciousness of a given individual must cease for ever when his brain is destroyed.

There is no minute one-to-one relationship
When I drive my car out of the car park after the football game, that experience is a small and fairly compact episode in my mental life in general. But the facts represented in the preceding sections of this chapter show that no small and compact area of the brain can be taking care of the physiological side of this performance. Major areas of the brain are working together; the brain as a whole is involved. Certainly, when the 'I' remembers, and when it reasons, there is no one-to-one relation between detailed thought processes and detailed brain structure.

Might the personality as a whole be inseparable from the brain as a whole?
Probably that is what the psychosomatic theorists would maintain. But to argue thus is merely to state a preference for a certain monistic kind of philosophy. It is *not* a legitimate deduction from observed facts. As Penfield himself said in 1957:

> 'Uneasy philosophers seem to be calling downward through the clouds:... "Can you prove yet ... that consciousness and nerve activity are the same thing?" ...
>
> The reply from below ... should be complete silence. Any scientist who looks up from his work to declare, for example, that the truth is to be found in monism or dualism, or that there is a middle ground, ceases to be a scientist.'

Two Ways in Which the Brain Affects Consciousness must be Recognized

To look at the body-mind problem without bias, it is essential that we recognize two pivotal facts: (1) that damage to brain structure may block or distort what the 'I'-thinker wants to transmit; and (2) that the chemical condition of the brain has marked effects on the moods and attitudes of the 'I'-thinker himself.

Even transmitting instruments do have localized functions
Penfield's experiment in placing his electrode on a speech area illustrates vividly the way in which blockage or damage to a localized structure might interfere with the use of the brain as a transmitting instrument. That experiment has the beauty of introducing a temporary interference with the speech function. Just as a broken connexion on a telephone, or a burnt-out fuse in a television set might stop the flow of communication without in any sense impairing the consciousness of the person seeking to transmit, so various sorts of damage and disorder to the brain would obviously be expected to produce interference, no matter whether the brain is a generator or a transmitter of consciousness.

The 'I'-thinker fluctuates
If a TV receiving set accidentally had some paint spilled on the front of the tube, parts of the action received through that tube would be obscured. That would be something like the way that damage to the speech centre of a man's brain prevents him from saying what he wants to say. In that case the TV actor who is giving the performance, and the 'I'-thinker whose brain is damaged may both be thought of as being fully normal, even though their transmitting instruments have been damaged. But changes in the 'I'-thinker himself present another kind of problem.

Whatever it is that thinks 'I' in any one of us is not a constant, unchanging reality. Nor is it something which progresses smoothly and consistently along a regular trend.

Rather (at least in the great majority of people) the 'I'-thinker observes clearly at certain times but very foggily at others; it may be seeing only the bright side of everything one day and only the gloomy side the next. Furthermore the actions of this essential self may be aggressive at one time and submissive at another - and may vary in countless other ways.

Brain chemistry determines some of these changes
Sometimes the moods and attitudes of the essential self may be traced to psychological experiences of success or failure, or the like. But at other times the chemical contents of the blood stream may be directly responsible. The behaviour of an intoxicated man, for example, is largely determined by the amount of alcohol in his blood.

The 'I'-thinker and his brain certainly interact
The analogies used in this chapter to express the transmission theory are actually much too crude. The TV actor is affected very little by what happens to any individual receiving set. Even the piano on which the musician learns to perform affects him relatively little as compared with the profound ways in which the growth and development of a given 'I'-thinker is affected by the structure, the chemistry and the functioning of the brain through which he observes and acts. And yet, this basic interaction does not appear to be inconsistent with the transmission theory.

What Hypothesis, then, Best Fits the Evidence as a Whole?

Is the brain the generator or the transmitter of consciousness?
In his 1925 statement, quoted early in this chapter, Dr. Broad presented two theories.

> (1) That the mind is existentially dependent on the organism and nothing else; or
> (2) That the mind merely uses the body as an instrument.

Broad concluded that theory (1) 'is compatible with all the normal facts, and is positively suggested by them'. He found that theory (2) 'is difficult to reconcile with the normal facts'. Opinions will still differ, but I myself find that theory (1) (which combines both the mechanistic and the psychosomatic theories) is exceedingly difficult to reconcile with the facts uncovered by brain research since 1925.

The mechanistic hypothesis breaks down
If the brain actually were an extremely compact electro-biological mechanism, that fact would be apparent in a very close one-to-one relationship between structure and function. The incoming sensory impulses would tend to create various brain circuits, and various skills and habitual behaviour patterns would be represented by highly specific groups of neurons through which efferent impulses would flow out. But the scientific evidence does not point in that direction. The vivid recollections which Penfield produced in his patients by electrical stimulation of the temporal lobe seemed (at first glimpse) to provide this sort of evidence. But when examined more closely it became clear that these patterns are *not* rigorously connected with specific combinations of cells in the brain. They move about and change. Penfield's discoveries make clearer than ever the facts which other brain scientists had previously discovered - namely, that memory is not localized in specific combinations of neurons.

That the brain is the instrument of the mind is the tenable alternative
If either of Broad's alternatives is 'the simplest possible view to take', it is the hypothesis that consciousness uses the brain as its instrument - not only for perception and for action, but also as a means of accumulating experience and for progressive development. A pianist uses his piano as a means of learning to be a musician, and then as a means of giving recitals. If his piano gets out of tune, if its strings become broken and if its keys stick, his concerts are not likely to represent his best ability. If the only available piano is destroyed in a fire, he is silenced as a musician. Perhaps, if someone lent him a harp, he might gradually learn to play on that - somewhat as communicators purportedly learn to communicate through the alien instrument of a medium's brain.

The transmission theory is consistent with the spiritistic hypothesis
In the present chapter we have been examining, in the light of the most recent evidence from brain surgery and experimental psychology, the objection raised by anti-survivalists and agnostics on the basis of the alleged dependency of consciousness on brain activity. When looked at impartially, this evidence appears to be favourable rather than unfavourable to belief in survival.

But let us now bring the results of this chapter into relation with the results of our inquiries in some of the earlier chapters. In mediumistic séances the communicators keep saying that they use the brain of the medium. We have seen mediumistic evidence which indicates that that claim is well supported. Then, when we look into the reports of ESP excursions, we find evidence that those who have had such experiences have actually observed and acted at long distances away from their physical brains. Finally, the apparitional and the cross-correspondence evidence points strongly towards the conclusion that persons whose brains have long since decayed into dust are still able, on occasion, to give evidence of their continuing capacity to think, their retention of earthly memories, and their post-mortem concern for their friends and loved ones.

The findings of psychical research and of brain research thus appear to be in harmony. Both point towards actual survival of human personality beyond bodily death.

Note:

The above article was taken from Hornell Hart's "The Enigma of Survival. The Case For and Against an After Life" (London: Rider & Co., 1959).

More articles by Hornell Hart

- Survival Versus Super-Psi
- Dodds and Murphy versus Drayton Thomas
- What is it that Survives?
- What Could Life Beyond Death by Like?