

PARAPSYCHOLOGY AND THE SENSORY-MOTOR HYPOTHESIS

Magne Dybvig
University of Trondheim

PART ONE
ON THE PHILOSOPHICAL IMPORTANCE OF PARAPSYCHOLOGY.

PARAPSYCHOLOGY AND PHILOSOPHY

There is a widespread popular interest in what may vaguely be described as inexplicable, mystical or supernatural phenomena. Such occult phenomena, as I shall call them, can also be made the object of scientific research. One can then distinguish between two different approaches (which can be combined in various ways). On the one hand, seemingly occult phenomena may be studied in order to find out why people believe in such phenomena. This is the historical, psychological, antropological and sociological study of superstition, witchcraft, magic, and so forth.

On the other hand, occult phenomena may also be studied in order to find out whether or not beliefs in such phenomena contain some truth -that there really are (something more or less similar to certain types of) occult phenomena. This is what we may call the validity-oriented study of occult phenomena.

No doubt parapsychology constitutes the most interesting example of a validity-oriented study of occult phenomena. By 'parapsychology' I

understand the investigation of psychological phenomena with a view to

- 1) ascertain whether or not some of these phenomena are paranormal in the sense that they involve a so-called psi-component, i.e., information about, or influence on, the environment that does not make use of any known sensory or motor mechanisms, and
- 2) formulate hypotheses about the nature of this psi-component and how it is related to other phenomena. Parapsychological research is validity-oriented research in so far as it involves investigating if at least some (seemingly) occult phenomena -such as telepathy, prophetic dreams, out-of-the-body-experiences- are genuine phenomena in the sense that they contain a psi-component that cannot be explained by science at the present time.

Parapsychology has remained a small academic discipline which has many of the characteristics of a rejected science, living a life on the borderline between what for most scientists are clear cases of pseudosciences, like astrology and numerology, and what are clear cases of respectable, recognised sciences (note 1). The total number of researchers engaged in parapsychological research is small, little of this research is published in 'orthodox' scientific journals, public financial support is negligible, and so on (cf. Allison 1979). Nevertheless, parapsychology has developed many of the typical traits of a scientific speciality. There are journals that specialise in publishing parapsychological research, parapsychological institutes and laboratories inside and outside recognised academic institutions, societies supporting parapsychological research, research- and teaching appointments outside and inside recognised academic institutions, and a professional organisation (PA) for parapsychologists with professional qualifications (cf. Collins & Pinch 1979).

Parapsychology has also attracted the attention of philosophers. This has partly been a matter of direct engagement in parapsychological research and in institutions supporting such research, partly a matter of philosophical research connected with parapsychological research. Throughout the years the professional philosophical interest in parapsychology has been quite considerable, considering the (comparatively) small numbers of philosophers. Several internationally well-known philosophers have concerned themselves with parapsychology (note 2).

Most philosophers with a sympathetic interest in parapsychology

could be said to agree on the following points, I believe:

Parapsychological research has at least

- a) succeeded in casting serious doubt on the proposition that paranormal phenomena never occur, and has consequently
- b) succeeded in casting serious doubts on scientific or philosophical theories that imply, or presuppose, that such phenomena never occur, and has consequently also
- c) succeeded in making it philosophically and scientifically interesting to contemplate the possibilities of theories that are compatible with, or even imply, the occurrence of such phenomena.

Some philosophers with an interest in parapsychology have maintained that parapsychology has done more than cast serious doubt on the proposition that paranormal phenomena never occur, it has also made probable, or even proved, that such phenomena really occur. Personally I am not willing to go further than the minimum expressed in a - c, but for me that is sufficient for taking an interest in parapsychology as a validity-oriented scientific study of occult phenomena.

SOME CENTRAL PARAPSYCHOLOGICAL CONCEPTS AND HYPOTHESES

The central parapsychological phenomena are best understood as various forms of exceptions to certain generally accepted hypotheses about how human beings (and other organisms) interact with the environment. Consider the following assumption, which we may call the sensory hypothesis, SH:

Information about the environment presupposes, directly or indirectly, sensory information about the environment.

Any exception to SH implies the combination: Information, but not (direct or indirect) sensory information. This combination means that we have a paranormal phenomenon, namely extrasensory perception, ESP. The sensory hypothesis is part of a larger theory of how human beings (and other organisms) adapt to the environment. The main elements of this theory may be formulated as follows.

1. Experiences and actions may in various ways, and to various degrees, correspond to, or fit, what goes on in the environment. A thought may be true or false and in that sense correspond to what is the case; what one wishes would happen, may happen and in that sense correspond to what actually happens; a depicted scene may be more or less similar to a real scene and in that sense correspond to a real scene, and so forth. That experiences and actions may thus correspond to what is the case, seems to be an important part of our common sense and scientific picture of ourselves (and other organisms). It is part of depicting ourselves as situated in an environment that we can either influence (and so make the environment conform to, or fit, what one wishes or intends) or obtain information from (and so make one's thoughts, images, assertions etc., conform to the environment).

2. Within the class of such organism-environment correspondences (oe-correspondences, for short) it is possible to distinguish between those correspondences which are due to chance and those correspondences which are not due to chance. It may for instance be just a coincidence that someone's wishes correspond to what actually happens, but if the person in question is capable of goal-directed actions, then such correspondences will not usually be the result of pure luck. In the same way, if a person is capable of perceiving what goes on in the environment, then most of the time it will not be just a coincidence that there is a correspondence between what the person experiences and what actually goes on in the environment. Generally, a precondition for looking on ourselves as conscious beings capable of intentional actions, is that we are thus capable of distinguishing between oe-correspondences which are, and oe-correspondences which are not, a result of coincidences.

3. Oe-correspondences which are not accidental correspondences either reflect the fact that we have information about the environment and/or that one influences the environment so that a correspondence is the result.

4. In so far as a oe-correspondence is the result of information about the environment, it has come about in certain characteristic ways:

- a) It is a result of one now perceiving something, or
- b) it is a result of one having perceived something and still remembering it, or
- c) it is a result of present or earlier perceptions which generate expectations and/or associations which somehow correspond to what is,

or what has been, perceived, or

d) it is a result of inferring what is the case on the basis of what one perceives, or has perceived, or expects to perceive, or associates with things already perceived.

5. In so far as an oe-correspondence is the result of influencing the environment, then it is either:

a) the result of bodily activities which directly bring about changes in the environment, or

b) the result of bodily activities which more or less indirectly bring about changes in the environment.

Let us call 4a - 4c sensory information (Se). Sensory information then includes both direct and indirect sensory information. 4 expresses what I call the sensory hypothesis (SH): All cases of information about the environment are cases of (direct or indirect) sensory information about the environment.

Let us call 5a - 5b motor influence (Mo). 5 then expresses what I shall call the motor hypothesis (MH): All cases of influencing the environment are cases of (direct or indirect) motor influence on the environment.

The general hypothesis that non-accidental oe-correspondences are the result of sensory information and/or motor influence, I shall call the sensory-motor hypothesis (SMH): All cases of non-accidental oe-correspondences between subject and environment are either cases of sensory information about the environment and/or cases of motor influence on the environment.

As mentioned earlier, central parapsychological phenomena may be regarded as exceptions to general hypotheses like SH, MH and SMH. Exceptions to SH I shall call extrasensory perception, ESP. The hypothesis that such exceptions really occur, I shall call the ESP-hypothesis (ESPH). I take it that an important task for parapsychological research is to decide whether or not ESPH is in fact valid. Since we have, as trivial logical equivalences, both

1) SH if, and only if, not-ESPH, and

2) ESPH if, and only if, not-SH

this means that one of the important tasks of parapsychological research is to decide whether or not SH is true. To decide between ESPH and not-ESPH is the very same thing as deciding between not-SH and SH, just as deciding between SH and not-SH is the same thing as

deciding between not-ESPH and ESPH.

Exceptions to the motor hypothesis (MH) I shall call psychokinetic phenomena, PK. The hypothesis that such phenomena occur I shall call the PK-hypothesis (PKH). Again I take it that it is an important task for parapsychology to decide whether PKH is true or whether not-PKH is true. That is, since we have the logical equivalences

1) MH if, and only if, not-PKH, and

2) PKH if, and only if, not-MH

one can say that one of the central tasks confronting parapsychologists is to decide whether MH is true or whether not-MH is true.

Exceptions to the general sensory-motor hypothesis SMH I shall call psi-phenomena, PSI. The hypothesis that such exceptions occur I shall call the PSI-hypothesis (PSIH). Again we have the logical equivalences:

1) SMH if, and only if, not-PSIH, and

2) PSIH if, and only if, not-SMH.

It follows that one of the most general tasks confronting parapsychology is to decide whether or not SMH is true (and, of course, formulate hypotheses about the relationship between exceptions to SMH and other phenomena, and the possible explanation of such exceptions).

ON THE PHILOSOPHICAL IMPORTANCE OF PARAPSYCHOLOGY

Granted that we understand parapsychology as the (validity-oriented) study of possible exceptions to the sensory hypothesis SH, the motor hypothesis MH, and the sensory-motor hypothesis SMH: What philosophical interest can such a study have? I shall not discuss all aspects of this question, but I shall attempt to say something about what general theoretical interest parapsychology can have even for people who don't think of themselves as especially interested in parapsychology. That is, I shall focus on some questions of general philosophical character that parapsychology exemplifies or illustrates in an interesting way.

First of all, it seems clear that parapsychology raises some conceptual questions which are of general interest. I'm here thinking of questions about how various parapsychological concepts are to be understood, such as: What is involved in the general concept of

paranormal phenomena? The concept of extrasensory perception? Psychokinesis? It may look as if such concepts are so special that they hardly have any interest outside a parapsychological context. I take it that it is however of some general interest to understand the content of such general hypotheses as, say, the sensory hypothesis SH, and to understand the content of SH is the same as understanding the content of the negation of SH, which is the hypothesis ESPH. It follows that if it is of interest both to parapsychologists and non-parapsychologists to understand what is involved in a general hypothesis like SH, then it should also be of interest to both parapsychologists and non-parapsychologists to understand the content of the parapsychological hypothesis ESPH. In particular, the concepts which are involved in formulating a general hypothesis like SH are the very same concepts which are involved in formulating its negation, namely ESPH, so the concepts that we have to analyse in order to analyse the meaning of SH, are the very same concepts that we have to analyse in order to analyse the meaning of ESPH. Starting with the concepts of 'information' and 'sensory information', and from there on again to concepts involved in these concepts -e.g., the concepts of 'corresponds cq. does not correspond to actual states of affairs' or 'is due to chance cq. is not due to chance'. These are the very same concepts that we have to understand if we are to understand the content of the sensory hypothesis SH.

It also seems clear that parapsychology raises epistemological problems and problems in the philosophy of science that must be of general interest (note 3). Parapsychology will to some extent be distinct from other disciplines cq. scientific specialities through its choice of research objects (concentration on phenomena that seem to contain a psi-component, and so constitute an anomaly in relation to 'orthodox' theories of how human beings can interact with the environment), through its choice of perspective (it is a validity-oriented study of such seeming anomalies), and through its choice of research hypotheses (at least sometimes one accepts as a reasonable working hypothesis that the seeming anomalies are genuine anomalies). At the same time it should be clear from what has been said above that the concepts and methods that one finds within parapsychology must to a large extent overlap with the methods and concepts that one finds within other disciplines. Consider, e.g., the question of whether we have, in a certain case, an example of ESP. The question is whether or not we have the combination I & not-Se, i.e., information I without sensory information Se. That is, we must ask: Is there information I?

Is there a lack of (relevant) sensory information S_e ?

It is clear however that since the concept of information I is not peculiar to parapsychology, the methods and techniques that parapsychology has at its disposal for deciding the first question, are not peculiar to parapsychology either. On the contrary, in so far as parapsychology aspires to the status of a science, the methods at its disposal for deciding whether or not there is information, cannot be different from those we find in other sciences dealing with information. In the same way, just as the methods for deciding that there is sensory information are not peculiar to parapsychology, so the methods for deciding that there is no sensory information available are not peculiar to parapsychology. In this way the general methodological questions connected with the concepts involved in formulating the central parapsychological hypothesis ESPH, are of interest to any science making use of the concept of information and the concept of (direct or indirect) sensory information.

It is also clear that not only epistemological and methodological questions connected with the concepts used in formulating the central parapsychological hypotheses have general interest. Methodological and epistemological questions connected with the hypotheses themselves also have general interest. This follows from the fact that propositions about the epistemic status of the hypotheses ESPH, PK and PSIH (i.e., propositions about what counts in favour of, and what counts against, such hypotheses) are logically equivalent to propositions about the epistemic status of the hypotheses SH, MH and SMH. Consider, for instance, the following statements:
There are good reasons for believing that ESPH is true.
There are good reasons for believing that ESPH is false.
There aren't good reasons for believing that ESPH is true.
There aren't good reasons for believing that ESPH is false.
Such statements are logically equivalent to the following statements about the sensory hypothesis SH:
There are good reasons for believing that SH is false.
There are good reasons for believing that SH is true.
There aren't good reasons for believing that SH is false.
There aren't good reasons for believing that SH is true.

It follows that epistemic questions raised in connection with ESPH, are epistemic questions raised in connection with SH, just as epistemic questions raised in connection with SH are epistemic questions raised in connection with ESPH. Consider, for instance, the following questions about ESPH:

What kind of evidence would make it reasonable to accept ESPH? Can single, well-documented instances of ESP establish ESPH, or must we have reproducible instances of ESP before we can regard ESPH as established? Must we have a theory that can explain how ESP is possible before we can have good scientific reasons for accepting ESPH? What kind of evidence would make it reasonable to reject ESPH? How many apparent instances of ESP must we show to be only apparent instances of ESP, before we can conclude that ESPH is false? Such questions can be reformulated to questions about SH: What kind of evidence would make it reasonable to reject SH? Can single, well-documented exceptions to SH refute SH, or must we have reproducible exceptions to SH before we can regard SH as refuted? What kind of evidence makes it reasonable to accept SH? How many apparent exceptions to SH must we have shown are only apparent exceptions to SH before we can conclude that there are no such exceptions?

Assuming that epistemic and methodological questions connected with general assumptions like SH are of interest both to parapsychologists and non-parapsychologists, it follows that epistemic and methodological questions connected with ESPH are of interest both to parapsychologists and non-parapsychologists. Particularly significant, it seems to me, is the fact that in so far as paranormal phenomena are understood as anomalies or exceptions in relation to certain general hypotheses about how human beings are constrained in their interaction with the environment, the verification of such phenomena is the same as the falsification of those general hypotheses. To verify ESPH (showing that it is probably true, or reasonable to accept), is for instance the same thing as falsifying SH. So formulating questions about how ESP H, PKH and PSIH are to be verified is just another way of formulating questions about how to falsify general assumptions like SH, MH and SMH. That means that parapsychology in a striking way illustrates issues having to do with scientific rationality and falsification. An important problem within philosophy of science is that of how scientists behave, or ought to behave, when confronted with occurrences that seem to falsify their theories. E.g., how does one behave, or how ought one to behave, when confronted with seeming exceptions to SH? That is, how does one behave, or how ought one to behave, when confronted with seeming occurrences of ESP? Most scientists have remained sceptical about, or have adopted a wait-and-see attitude towards hypotheses like ESPH, PKH AND PSIH (note 4). That is another way of saying that they have remained sceptical about, or adopted a wait-and-see attitude towards claims to the effect that SH, MH or SMH have been falsified. The question then

is what determines such attitudes, and how rational they are (note 5). Especially interesting in this connection is the now quite considerable body of literature critical of parapsychology, claiming that parapsychology has not succeeded in falsifying, or even cast serious doubt on, 'orthodox' principles such as the sensory-motor hypothesis (note 6). Such criticism may be looked on as expressing more or less legitimate (or illegitimate) strategies for avoiding the falsification of established theories like SMH.

PART II THE PSI-HYPOTHESIS

TWO WAYS OF UNDERSTANDING THE SENSORY-MOTOR HYPOTHESIS

In this part I shall discuss in somewhat more detail what is involved in what I regard as the most general and important parapsychological hypothesis, the psi-hypothesis PSIH. As explained earlier, such a discussion may, without loss of meaning, be reformulated as a discussion of the sensory-motor hypothesis SMH, and I shall make extensive use of this reformulation in the following remarks.

The sensory-motor hypothesis SMH says that non-accidental correspondences between (states and activities of) a subject and its environment come about through (direct or indirect) sensory interaction with the environment, and/or through (direct or indirect) motor interaction with the environment. I shall distinguish between two possible interpretations of this hypothesis: as a default principle, and as a universal principle.

As a default principle SMH says something about what is normally, or typically the case: normally, or typically, correspondences between subject and environment come about through the use of sensory-motor mechanisms.

As a universal principle SMH says that oe-correspondences always come about in this way: it excludes the idea that such correspondences, in so far as they are non-accidental correspondences, could have come about except through the use of sensory-motor mechanisms. In the same way SH and MH may either be understood as default principles or as universal principles.

Considered as default principles SMH, SH and MH articulate important aspects of our human experience. They articulate constraints on possible man-environment interactions that we take for granted in most contexts. We take it for granted that if we don't have guesswork, luck, coincidence, etc., then we have an adaptation to the environment that is either (directly or indirectly) the result of sensory information, or the result (directly or indirectly) of some motor influence on the environment. We can hinder people in getting information by hindering them in getting necessary sensory information (we hide something in a drawer, put it in an envelope, refuse to say something, etc.), and we can hinder people in influencing their environment by hindering their physical influence on the environment (we put something outside somebody's reach, we block somebody's movements, we lock somebody in, etc.). We have thus many, many times implicitly tested SMH, SH and MH and seen it confirmed that they express very real limitations on what non-accidental oe-correspondences are possible. Many institutions -lotteries, the secret police, jails, spies, etc.- could not have existed if hypotheses like SMH, SH and MH were not by and large valid. The fact that such institutions do exist may in itself be taken as evidence that such principles are at least valid as default principles.

On a deeper level the validity of SMH, SH and MH as default principles may be seen as reflecting our very existence as embodied beings. Part of what it means to say that a certain body B is the body of a person P, is that there are constraints on what objects in the environment P can have information about or influence, and that these constraints are centered around the body B. Things can for instance only be moved by me in so far as parts of my body can be moved by me, that is, in so far as there is this sort of limitation on what can be moved by me. In the same way, there are radical limitations on what I can be aware of (I cannot see the object that is hidden behind another object, and I'm not aware of it at all if I cannot infer its existence on the basis of something else that I perceive, etc.), and these limitations are centered around those parts of my body that we call sense organs. That it is parts of B that have this privileged position is a presupposition for B being my body. In general, there cannot be that complex network of possibilities for action and awareness that characterise a living organism without a similarly complex network of impossibilities for action and awareness. SMH, SH, and MH considered as default principles may be taken as expressing such 'necessary impossibilities'. Nothing of this excludes, however, that there are various forms of

exceptions to SMH. It only concerns SMH's validity as a default principle, i.e., as an expression of what is normally, or typically, the case.

It is only SMH as a universal principle that excludes the possibility that there are exceptions to it. One way of expressing this is to say that according to SMH, understood as a universal principle, all seeming exceptions to SMH can only be seeming exceptions, not real exceptions. This means that there are certain conjunctions of 'seemings' that must always include one or several 'seemings' that are only 'seemings'- i.e., some kind of illusions. Suppose, e.g., that there seems to be a nonaccidental correspondence between my description of a letter and the content of the letter. Then, according to SMH regarded as a universal principle, either it must a) only seem as if there is a non-accidental correspondence (i.e., it is really a question of guessing, being lucky, etc.), or b) it must only seem as if I have no (direct or indirect) sensory awareness of the content of the letter (I have read it earlier, or I have inferred what it is about, etc.), or c) it must only seem as if the description of the letter (or the thoughts behind the description of the letter) has no physically mediated influence on the content of the letter (I, or somebody else who has come to know what I believe about the letter, have changed the content of the letter, etc.).

Granted that it is reasonable to accept SMH (or SH, or MH) as some kind of default principle, is it also reasonable to accept SMH as a universal principle ?

Of course, if seeming exceptions to SMH never occur, this question is not of much interest. But it is an important aspect of human experience that it has a double structure. On the one hand, there are innumerable cases where things seem to happen in accordance with SMH, and where our actions and expectations are adapted to this fact. On the other hand, there is a comparatively small, but still significant number of cases where exceptions to SMH seem to occur. It is also a fact that the idea of such exceptions to SMH plays an important part in human life. The idea of such exceptions, conceptualised as e.g. prophecies, miracles, or possessions by the devil, plays an important part in human religious beliefs. It also plays an important part in beliefs in magic, witches, spells, etc. The seeming experience of, and belief in, exceptions to SMH also plays an important part in human life outside of such religious or superstitious contexts. Many people seem to experience, now and then, exceptions to SMH in the form of

e.g. sudden premonitions, thought-readings, or dreams that come true. In fact, the experience of such seeming exceptions to SMH, and also the belief that some of them represent real exceptions to SMH, is fairly common, even in modern, industrialized cultures (note 7). It is therefore natural to ask, what reasons are there for accepting SMH, SH and MH not only as default principles, but also as universal principles, in spite of the many apparent exceptions to them?

SOME ASSUMPTIONS ABOUT EXCEPTIONS TO THE SENSORY-MOTOR HYPOTHESIS

In the following I shall only discuss SMH as a universal principle. The PSI-hypothesis PSIH is the negation of SMH understood in this way. I shall start by elaborating a point that is fairly trivial, but also fundamental. It is that SMH is really a fairly complex set of assumptions that it will always be possible to maintain in the face of any seeming exceptions to it. In other words, experience will never force us to abandon SMH, because by suitable modifications of one's assumptions one can make SMH fit any possible experience. This is not unique to SMH, of course, but it is no less true for SMH than for other theories. Some of the most important defensive strategies that SMH lends itself to, can be described in the following way: We have an apparent PSI-event, i.e., an apparent exception to SMH, if we seem to have 1) an oe-correspondence C between subject and environment which 2) is not a chance coincidence A, and 3) is not the result (directly or indirectly) of sensory information S_e , nor 4) a result, directly or indirectly, of motor influence M_o . So an apparent PSI-event is an event where we seem to have the following conjunction:

C & not-A & not- S_e & not- M_o

If we believe in SMH and are confronted with an apparent PSI-event which tempts us to believe that PSI-events really occur, we have a dilemma. We cannot both accept SMH and accept that we are confronted with a genuine PSI-event. But of course, the conflict need not be resolved by discarding SMH. Instead one can maintain that what one is confronted with is only an apparent, and not a genuine PSI-event. That is, one may reject one or several of the conjuncts in the conjunction:

C & not-A & not- S_e & not- M_o

The following table (where T stands for what one regards as true, and

F for what one regards as false) indicates the most important combinations that are possible:

	1	2	3	4	5
SMH	F	T	T	T	T
C	T	F	T	T	T
not-A	T	T	F	T	T
not-Se	T	T	T	F	T
not-Mo	T	T	T	T	F

1 stands for what we may call the paranormal option, namely that necessary and sufficient conditions for a PSI-event exist and that SMH is rejected. 2-5 indicate the most important alternatives to the paranormal option. Consider alternative 2. One can doubt that the supposed oe-correspondence really exists, and maintain that the person in question is wrongly described (perhaps because he himself remembers wrongly, or lies, or dramatizes, or exaggerates) as to the degree of correspondence between the states/activities of the person and events in the environment. Or consider alternative 3. Here one doubts that the oe-correspondence is a non-accidental correspondence. Since even very improbable coincidences now and then happen by chance alone, the claim that we really have an accidental coincidence A is of course impossible to refute definitely. Yet another alternative is 4. One may maintain that, in spite of appearances, we really have a case of direct or indirect sensory information. This is also an alternative which it is difficult to reject definitely, since there are so many ways in which one can have some form of indirect sensory information. In the same way it will be difficult to reject 5 definitely, i.e. that the oe-correspondence is the result, more or less directly or indirectly, of some physical influence on the environment. And of course, if it is difficult to reject definitely each of the alternatives 2-5 separately, it is even more difficult to refute definitely the indeterminate proposition that, somehow, one of the alternatives 2-5, rather than 1, must obtain.

In sum, there are so many loopholes when it comes to explaining away possible counterexamples to the sensory-motor hypothesis, that it is hard to imagine that anybody could be forced to give it up because of possible counterexamples (especially in a world where it is valid anyway as a default principle). This is perhaps one reason (among several) why it is accepted not only as a default principle, but also as a universal principle. In any case, if one is to seriously test SMH

as a universal principle, one must not only (as pointed out above) accept what one may call the principle of normality:

PN: The sensory-motor hypothesis must in any case be valid as a default principle

but also what we may call the principle of fallibility:

PF: The sensory-motor hypothesis can under no circumstances be definitely falsified through counterexamples.

Reformulated as a proposition about PSI-events, PF can also be formulated thus:

PF: The PSI-hypothesis PSIH can under no circumstances be definitely verified by adducing counterexamples to SMH, i.e., through adducing examples of PSI-events.

But none of this excludes, of course, the possibility that there are cases of apparent PSI-events that in plausible and reasonable way can be explained within the framework of the sensory-motor hypothesis. Nor does it exclude the possibility that there are apparent counterexamples to the hypothesis that cannot be plausibly explained in this way. To a certain extent it is reasonable to expect that apparent exceptions to SMH can be explained away within the framework of SMH itself. Consider the matter from this point of view: To give a general account of how exceptions to SMH can be explained away within the framework of SMH itself (i.e., without making use of assumptions which are incompatible with SMH), involves showing how one would expect apparent exceptions to SMH to occur even within a universe where SMH was valid without exception. This one can do, along the following lines:

If there are apparent exceptions to SMH which are not real exceptions to SMH, this must be because, either

- there are apparent oe-correspondences C which are not real oe-correspondences C, or
- there are accidental correspondences A which only seem to be non-accidental correspondences, or
- there is an apparent lack of (direct or indirect) sensory information S_e , which is not a real lack of sensory information, or
- there is an apparent absence of motor influence M_o which is not a real absence of motor influence.

This is a list of types of illusions that we know occur now and then. Hence we know that events must be expected that will give the false impression of being exceptions to SMH. We even know enough about such cases to give a fairly detailed account of how apparent exceptions to SMH are bound to occur. For instance, we know that human beings have problems judging the probability of certain coincidences happening by chance alone, and therefore may easily get the impression that something is a non-accidental coincidence when in fact it is an accidental one. We know that human beings may unconsciously remember things, or unconsciously infer things, or subliminally perceive things, so that one may get the impression that there is no relevant sensory information when there in fact is such information. We also know that human beings more or less unconsciously, and more or less indirectly, can physically influence their environment so that one gets the impression that there is no relevant motor influence when in fact there is motor influence (note 8). We know, then, that even if SMH is valid (as a universal principle), there must be events giving the impression of being exceptions to SMH. Such apparent exceptions to SMH are therefore of little importance as counterarguments to SMH. One can even maintain that SMH is supported not only by the events which obviously support it, but also by its apparent exceptions, because these seeming exceptions may be looked upon as necessary side-effects of just that cognitive and physiological apparatus that SMH presupposes. The following assumption therefore, which I shall call the principle of illusory exceptions, may also be regarded as a reasonable assumption to make when seriously testing the validity of SMH:

PIE: We must expect that many, probably most, apparent exceptions to the sensory-motor hypothesis SMH can be satisfactorily explained within the framework of that hypothesis itself.

If we call apparent PSI-events which are not real PSI-events for PSI-illusions, we can formulate this as a proposition about PSI, thus:

PIE: We must expect that many, probably most, apparent PSI- events are really PSI-illusions.

It is clear however, that even if many, perhaps most, apparent exceptions to SMH can be explained in this way, this is not necessarily true for all of them. If we are seriously to test SMH as a universal principle, we must actively seek for, or set up, situations where the sources of possible illusions mentioned above are

eliminated, in order to see if exceptions to SMH still occur. If we are to seriously attempt to test the sensory-motor hypothesis therefore, the following assumption, which I shall call the test-principle, also seems to be a reasonable assumption:

TP: A serious attempt to falsify SMH presupposes that one actively seeks for, or sets up, situations where the possibilities for PSI-illusions are satisfactorily eliminated.

Formulated as a proposition about PSIH, we have:

TP: A serious attempt to verify the PSI-hypothesis PSIH presupposes that one actively seeks for, or sets up, situations where the possibilities for PSI-illusions are satisfactorily eliminated.

"Satisfactorily eliminated" does not mean "definitely eliminated" (cf. the principle of fallibility), but something like "what one has good reasons for believing eliminated". We are now back to parapsychology understood as the validity-oriented study of apparent PSI-events. If one is seriously interested in attempts to falsify the sensory-motor hypothesis, one must turn to parapsychology, since it is there that one finds most attempts to test SMH within the framework of what I call the test-principle TP, i.e., by actively seeking for, or setting up, situations where the possibilities for PSI-illusions are satisfactorily eliminated.

OUGHT ONE TO TAKE THE PSI-HYPOTHESIS SERIOUSLY?

The history of parapsychology could be regarded as repeated attempts to show that even when the possibility of PSI-illusions are satisfactorily eliminated, apparent exceptions to SMH will occur, and that consequently it is unreasonable to assume that all apparent exceptions to SMH can be explained within the framework of SMH itself, i.e., by only presupposing sensorimotor forms of interaction with the environment. No doubt many of these attempts have resulted in interesting negative findings, in the sense that they have documented that many apparent exceptions to SMH can be explained within the framework of SMH itself as being the result of misperception, methodological error, fraud, lapse of memory, etc. They have also often led to the result that when opportunities for PSI-illusions are satisfactorily eliminated, apparent exceptions to SMH have

disappeared, something which might again be taken to indicate that apparent exceptions to SMH are just that—apparent exceptions (note 9). That one is able to explain away exceptions to a hypothesis like SMH within the framework of this hypothesis itself, is something that adds credibility to the hypothesis. The many negative research findings that one finds in the history of parapsychology are not just failures to find support for PSI, they are findings that positively lend support to SMH. One can also maintain that these negative research findings indicate that the most fruitful research strategy for explaining exceptions to SMH, is to attempt to explain them within the framework of SMH itself.

The sensory-motor hypothesis is part of an extensive and elaborate system of theories that comprises not only SMH, SH, and MH, but also theories about the cognitive and physiological apparatus that makes possible our sensory-motor interactions with the environment. It is this whole corpus of knowledge, which also comprises theories about how different types of illusion are generated, that we can draw on when explaining apparent exceptions to SMH. The point isn't just that it is fruitful to attempt as far as possible to explain exceptions to SMH by use of known principles and mechanisms. One must of course attempt this, but the question is if it is always possible. One may maintain that the many negative results in parapsychology indicate that this in fact is possible, and that it will pay to direct one's efforts towards explaining exceptions to SMH in terms of those cognitive and physiological mechanisms that SMH itself is a reflection of.

It would however be seriously misleading to maintain that in all cases where the possibility of PSI-illusions has been satisfactorily eliminated, exceptions to SMH have failed to show. There are potentially three classes of parapsychological investigations: 1) Investigations where the possibility of PSI-illusions is satisfactorily eliminated, and where the result is negative, 2) investigations where the possibility of PSI-illusions is not satisfactorily eliminated, and where the result is either negative or positive, and 3) investigations where the possibility of PSI-illusions is satisfactorily eliminated, and where the result is positive in that exceptions to SMH still seem to occur. No doubt there are many parapsychological investigations that must be placed in either classes 1) or 2), but to maintain that all parapsychological investigations belong in either of these two classes, seems unreasonable. It seems to be the result of using one of the following two strategies: A) Using

the definite elimination of possible PSI-illusions as a criterium for the satisfactory elimination of possible PSI-illusions, or B) using the fact that the investigation ends in a positive conclusion as a proof that possible PSI-illusions have not been satisfactorily eliminated. Since there is no reason to believe that SMH can be definitely falsified (cf. the principle of fallibility -the definite elimination of possible PSI-illusions in a parapsychological study with positive conclusion would be such a definite falsification), the use of strategy A) certainly means that all parapsychological studies must be placed in classes 1) or 2). The same goes for B), of course. It is also clear that if one operates with such criteria for the satisfactory elimination of possible PSI-illusions, SMH is made immune to possible falsification.

If such strategies that make SMH immune to falsification are abandoned, must we then conclude that SMH has in fact been refuted, that it has in fact been shown that it is more reasonable to reject than to accept SMH (as a universal principle)? Personally I'm not willing to go that far on the basis of the research material that I'm familiar with, since I also see (as many others, including parapsychologists, have) important reasons of a methodological and theoretical character which count against accepting the reasons in favour of PSIH as sufficient reasons for accepting PSIH (i.e., as sufficient reasons for rejecting SMH). I cannot go into the details of these arguments here. Let me however just briefly mention some of them.

1) To accept PSIH is nothing other than to reject the sensory-motor hypothesis SMH and all those theories about man-environment interaction which make use of SMH. It is not that one has any alternative to those theories.

That is, there is no alternative theory H which both implies that PSI-events will occur and overlap with SMH in the cases where it must still be considered valid. In that sense SMH and the physiological and cognitive theories connected with it, are the only usable theories we have at present. It is reasonable that one hesitates to give up the only usable theories one has.

2) In conformity with 1) one can also argue that we lack an important reason for accepting that exceptions to SMH really occur -what we can call theoretical reasons. That is, there is no theory H for which there exists independent empirical confirmation and which implies that exceptions to SMH occur. That one lacks such reasons may make one

doubt that the reasons we have for rejecting SMH (as a universal principle) are sufficient reasons for rejecting SMH.

3) One also finds wanting another type of reason for conceding that exceptions to SMH occur -what one may call experimentally repeatable reasons. That is, one has not succeeded in finding experimental conditions E such that exceptions to SMH reliably occur under those circumstances, so that also those sceptical about the occurrence of such phenomena may check for themselves that they really occur. This may again make one doubt that one has sufficient reasons for rejecting SMH.

4) The hypothesis SMH is not an isolated generalisation, but a generalisation connected with, and supported by other assumptions about the human cognitive apparatus. One knows, e.g., a great deal about how mental processes are dependent upon the brain which is again dependent upon nerve connections between brain and muscles and sense organs in order to influence the environment or receive information from it -something which in sum may be take as strongly supporting the view that a human being (as well as a human brain) is dependent upon sensorimotor mechanisms in order to obtain information from, and influence, the environment. It is this whole complex of assumptions surrounding SMH which is threatened when SMH is threatened. Let us call these assumptions H. We then have, schematically: If PSIH, then not-H, i.e., we have: If H, then not-PSIH. Consequently, in so far as there is empirical support for H, there is also empirical support for not-PSIH, i.e., for the assumption that exceptions to SMH do not occur.

5) Various seemingly well-documented exceptions to SMH which have been reported in parapsychology have apparently not only been exceptions to SMH and physiological and psychological principles connected with it, but also exceptions to certain general principles which concern not only psychology and physiology, but also physics and chemistry, and in some cases (one could argue) all science. The most striking example is that some exceptions to the sensory hypothesis SH seem to involve not only present events, but also future events. If we assume that the information in question presupposes a causal connection (in the widest sense) going from what one has information about to the states and activities of the subject where this information find its expression (dreams, guesses, premonitions, etc.), then we don't only have an exception to SMH, but also an exception to the general principle that future event cannot influence past events. Let us call this principle

the causal-temporal principle CT, and the hypothesis that exceptions to SMH which are also exceptions to CT really do occur, the precognitive hypothesis PCH. Then we have: If PCH, then not-CT, i.e., if CT then not-PCH. So, if there are good reasons for assuming CT (empirical reasons, and perhaps also conceptual or metaphysical reasons), then there are also good reasons for assuming that at least the type of exceptions to SMH which are precognitive events, do not really occur.

1)-5) indicate that we do not yet have sufficient reason for maintaining PSIH, i.e., for rejecting the sensory-motor hypothesis. One thing is however to lack sufficient reason for preferring not-SMH (i.e., PSIH) to SMH, another is to maintain that one has no reasons -significant and important reasons- for doubting SMH. It seems to me that the apparent exceptions to SMH that we know from parapsychology are sufficient to cast serious doubt on the proposition that exceptions to the sensory-motor hypothesis never occur. In so far as this is the case there are good reasons for taking the PSI-hypothesis PSIH seriously. There are also good reasons for devoting time and resources to examining it. Our reasons for continuing the investigation of a hypothesis is not that we know it to be true, but that we have interesting reasons for believing that it may be true.

NOTES

1) Partly as a result of what is sometimes referred to as post-empiricist philosophy of science (i.e., the criticism, found in the works of Feyerabend, Hanson, Kuhn, Laudan, Polanyi, Toulmin, of logical empiricism and its ahistorical approach to the philosophy of science), the demarcation between science and pseudo-science has become increasingly problematic. This may be one reason why parapsychology has increasingly attracted the attention of philosophers, historians and sociologists of science. Anthologies and monographs illustrating this trend are Cerullo 1982, Collins & Pinch 1982, Grim 1982, Hanen, Osler & Weyant 1980, Laudan 1983, Mauskopf 1979, Mauskopf & Vaugh 1980, McClenon 1984, Wallis 1979.

2) Summing up his review of philosophers' contributions to parapsychological research, J.F.Nicol writes: "If we consider the mere quantity of work published by philosophers, we need to realize that philosophy is a very small profession ... it is safe to say that

philosophers have produced more research than other professions" (Nicol 1976, p.168)

The list of well known philosophers who have functioned as presidents of The Society for Psychical Research is impressive: H.Sidgwick; W.James; H.Bergson; F.C.S.Schiller; H.Driesch; C.D.Broad; H.H.Price; C.W.K.Mundle.

Philosophers' interest in philosophical questions connected with parapsychology are exemplified by several anthologies, e.g., Ludwig 1978, Shapin & Coly 1976, Thakur 1976, Wheatley & Edge 1976. Among well known philosophers who have made a quite considerable contribution to the literature connected with parapsychology are C.D.Broad, C.J.Ducasse and H.H.Price. They are all represented in Wheatly & Edge 1976.

3) To philosophers the sensory hypothesis SH will be of particular interest in that it can be interpreted as one way in which to formulate the empiricist principle that all knowledge (of a non-analytical character) must build on sense experience. What is interesting with SH in a parapsychological context is that it is treated as an empirical thesis which can be either undermined or supported by empirical evidence. A principle like SH can of course be interpreted in many different ways, and not all interpretations will make it a hypothesis that can be tested empirically. If one is of the opinion (see e.g. Quine 'Epistemology naturalized') that an empiricist principle ought to be interpreted as some kind of empirical thesis, then this way of interpreting SH should be of particular interest. But even if one doesn't agree with this position, it should still be of interest to see elucidated, conceptually and epistemologically, what is involved in a sensory hypothesis SH when it is interpreted as some kind of empirical proposition. This discussion will then coincide with the parapsychological-philosophical discussion of what is involved in the concept of ESP, i.e., what is involved in the concept of exceptions to SH.

4) In the literature mentioned in note 1, one will find many examples of seemingly positive findings in parapsychology being fiercely challenged. We have to remind ourselves, however, that it may be difficult to judge how intense the resistance, or scepticism, towards parapsychology is among scientists in general. One thing is the attitudes of the most engaged combatants, another is the attitudes of scientists in general. Doubt and uncertainty, rather than dogmatism and aggressive certainty, seem to have been typical of the famous controversies in the history of parapsychology (cf, Mauskopf & Vaugh

1976: 'Parapsychology and the American Psychologists: A study of scientific ambivalence'; and Palfreman 1979: 'Between scepticism and credulity: A study of victorian scientific attitudes to modern spiritualism').

Scepticism about the truth of a proposition is of course compatible with a positive interest in seeing the issue examined further. In surveying members of the American Psychological Association, Warner and Clark found that only 9% had a positive attitude as to the probability of ESP really existing, but 89% were of the opinion that ESP was a legitimate field of research (Warner & Clark 1938). In another survey of APA-members (Warner 1952) 17% had a positive attitude towards the probability of ESP existing, but again 89% had a positive attitude towards ESP as a legitimate field of research.

5) To what extent it will appear rational to uphold to the sensory-motor hypothesis SMH -that is, reject the PSI-hypothesis PSIH- in spite of seeming counterexamples (i.e., seeming examples of PSI), may partly depend upon fundamental methodological assumptions. There are several possibilities. E.g., if one sides with Popper in emphasizing the importance of repeatable counterexamples to a general hypothesis as essential to its falsification (c.f. Popper 1974, p.86), then the lack of repeatable experimental results that one typically finds in parapsychological research, may be a decisive reason for upholding SMH in spite of seeming counter-examples. If one sides with Kuhn (c.f. Kuhn 1970, p.24) and stresses the functional importance for the development of a normal science (i.e., the elaboration of a paradigm) that one not give up a paradigm too quickly in the face of seeming anomalies, then it may also appear rational to uphold SMH (considered as part of a paradigm) in spite of apparent exceptions to it. Inspired by Lakatos (c.f. Lakatos 1980, p.118), one might also regard SMH as part of the hard core of a research program for exploring the interaction between man and environment, and regard the PSI-hypothesis PSIH as part of (or the germ of) another such research program. If one then looks at SMH as part of a still progressive research program which (contrary to research programs incorporating the PSI-hypothesis) are producing interesting results (e.g. when it comes to understanding various forms of apparently paranormal phenomena), it may also appear rational to uphold SMH in spite of exceptions to it which resist a 'normal' interpretation. For my own part I have no problems accepting that there are reasons why one should not reject SMH (cf. 6). I have, however, some problems seeing why it may not also be worth while, in the light of parapsychological research findings, to explore another possibility at the same time,

namely that the PSI-hypothesis is in fact correct, and that we may in the end have to find some alternative to SMH (considered as a universal principle) and theories incorporating SMH.

6) Criticism of parapsychology can be found in e.g., Alcock 1981, Marks & Kammann 1980, Hansel 1980, Kurtz 1985, and Taylor 1980. In these books one find exemplified all the strategies for defending the sensory-motor hypothesis that I sketch in 5). Different authors put different weight on different strategies. Marks & Kammann 1980, emphasizes the problems human beings have in judging the probability of chance coincidences (so that one sees unexplainable connections where there really are no connections). In Hansel 1980 the possibility of direct or indirect sensory information/motor manipulation even in seemingly strictly controlled experimental conditions, plays a more important part. The weight that Hansel and several other critics of parapsychology (particularly G.Price 1955) have put on possible frauds when explaining away possible exceptions to SMH is remarkable. One can of course always save the sensory-motor hypothesis from falsification by assuming sufficiently complicated cases of fraud. In some (but by no means all) their attacks on parapsychology Hansel, and several other critics of parapsychology, have come dangerously close to making the sensory-motor hypothesis immune to any possible falsification.

7) Systematic surveys seem to confirm this. E.g., in Danish survey from 1957 about one out of ten claims to have had some psychic experience. In a German survey about one out of five makes a similar claim. In an Icelandic survey from 1974 (a country which seem to have strong 'psychic' traditions) the number is as high as two in three (for comparisons, and details of the Icelandic survey, see Haraldsson et al. 1976). Such surveys are of course to be treated with care, but at least they seem to indicate that experiences that give the subjective impression of involving a psi-component, are quite frequent. Not only the experience of apparently paranormal events seems to be fairly frequent, the belief that such events really occur also seems to be frequent. After a review of some of the more important surveys in this field, Alcock (Alcock 1981) concludes: "... belief in the paranormal, psychologists aside, is currently very common. Various studies of university undergraduate and graduate students . . have indicated that amount of university education has virtually no effect on this" (p.27).

It is of some interest that persons with an academic background often seem to believe that e.g. ESP really occurs. One of the papers

that Alcock refers to is "Attitudes of college professors toward extrasensory perception" from 1970 (U.S.A.). Here Wagner and Monet report that 66% of those responding (1184 out of 2400) were disposed to believe that ESP could occur, while 23% were sceptical. Wagner and Monet compared this with the attitudes toward paranormal phenomena expressed in a Gallup poll, where only one-half of the sample expressed belief in ESP, and concluded that their group had attitudes towards ESP that were more positive than those of the public in general. Again we have an indication that scepticism towards the sensory-motor hypothesis as an exceptionless principle is quite frequent, even among people trained in 'established' or 'orthodox' academic disciplines.

8. Both Marks and Kammann 1980 (see especially chap. 11 and 12) and Alcock 1981 (see especially chap. 4 and 5) have interesting discussions of various 'normal' cognitive mechanisms that may result in (subjective) paranormal experiences. See also Morris 1986.

9. Some of the institutions of parapsychology (e.g. the Society for Psychical Research) have done much useful work in this respect. Getting a correct picture of how often parapsychological experiments give a negative (nonsignificant) result, is notoriously difficult, because many negative results are never published. Judging from published material found in parapsychological research journals, the yearly 'Research in Parapsychology', and reviews like e.g. Palmer 1980, negative results must be quite common.

ABSTRACT

This paper is in two parts. In part one I discuss the concept of paranormal phenomena and what general theoretical and philosophical interest the study of such phenomena may have. Parapsychology is the validity-oriented study of possible exceptions to certain general and rather complex principles of how human beings (or other organisms) can obtain information about, or influence, their environment. Parapsychology is of general theoretical and philosophical interest in so far as the study of these principles is of general theoretical and philosophical interest.

In part two I discuss in somewhat more detail what is involved in the study of possible psi-phenomena. Psi-phenomena are understood to be exceptions to the general principle that we can only obtain information about, or influence, the environment through sensory or motor interaction (the sensory-motor hypothesis). It is also discussed to what extent one ought to take seriously the hypothesis that psi-events really occur.

REFERENCES

- Alcock, J.E. 'Parapsychology: Science or magic'. Toronto, 1981.
- Allison, P.D. 'Experimental parapsychology as a rejected science', in Wallis, 1979.
- Cerullo, J.J. 'The secularization of the soul. Psychical research in modern Britain', Phil., 1982.
- Collins, H.M. and Pinch, T.J. 'Frames of meaning. The social construction of extraordinary science', London, 1982.
- Collins, H.M. and Pinch, T.J. 'The construction of the paranormal: Nothing unscientific is happening', in Wallis, 1979.
- Edge, H.L., Morris, R.L., Palmer, J. and Rush, J.H. 'Foundations of parapsychology', London, 1986.
- Grim, P. (ed.) 'Philosophy of science and the occult', New York, 1982.
- Hanen, M.P., Osler, M.J., Weyant, R.G. (eds.) 'Science, pseudo-science and society', Wilfrid Laurier University Press, 1980.
- Hansel, C.E.M. 'ESP and parapsychology: A critical re-evaluation', New York, 1980.
- Haraldsson, E., Gudmundsdottir, A., Ragnarsson, A., Loftsson, J., Jonsson, S. 'National survey of psychical experiences and attitudes towards the paranormal in Iceland', in Research in Parapsychology 1976, London, 1977.

- Johnson, M. 'Parapsykologi', Uddevalla 1980.
- Krippner, S (ed.) 'Advances in parapsychological research. Part II. Extrasensory perception', New York, 1978.
- Kuhn, T.S. 'The structure of scientific revolutions', Chicago, 1970.
- Kurtz, P. (ed.) 'A sceptic's handbook of parapsychology', Buffalo, 1984.
- Lakatos, I.M. and Musgrave, A (eds.) 'Criticism and the growth of knowledge', London, 1980.
- Lakatos, I.M. 'Falsification and the methodology of scientific research programs', in Lakatos and Musgrave, 1980.
- Laudan, R. (ed.) 'The demarcation between science and pseudoscience', Working papers in science and technology, Volume 2, Blacksburg, Virginia, 1983.
- Ludwig, J. (ed.) 'Philosophy and parapsychology', New York, 1978.
- Mauskopf, S.H. (ed.) 'The reception of unconventional science', A.A.A.S. Selected Symposium 25, Boulder 1979.
- Mauskopf, S.H. and Waugh, M.R. 'Parapsychology and the American psychologists: A study of scientific ambivalence', in Shapin and Coly, 1976.
- Mauskopf, S.H. and Waugh, M.R. 'The elusive science', J. Hopkins University Press, 1980.
- Marks, D. and Kammann, R. 'The psychology of the psychic', New York, 1980.
- McClenon, J. 'Deviant science: The case of parapsychology', Philadelphia, 1984.
- Morris, R.L. 'What psi is not: The necessity for experiments', in Edge, Morris, Palmer and Rush, 1986.
- Nicol, F.J. 'Philosophers as psychic investigators', in Shapin and Coly, 1976.

Palmer, J. 'Extrasensory perception: Research findings', in Krippner, 1978.

Palfreman, J. 'Between scepticism and credulity: A study of Victorian scientific attitudes to modern spiritualism', in Wallis, 1979.

Popper, K.R. 'The logic of scientific discovery', London, 1974.

Price, G.R. 'Science and the supernatural', *Science*, 122, 1955, 359-367.

Quine, W.V.O. 'Epistemology naturalized', in Quine, 1969.

Quine, W.V.O. 'Ontological relativity and other essays', London, 1969.

Shapin, B. and Coly, L. (eds.) 'The philosophy of parapsychology', New York, 1976.

Thakur, S.C. (ed.) 'Philosophy and psychical research', London, 1976.

Wagner, H.H. and Monnet, M. 'Attitudes of college professors toward extrasensory perception', *Zetetic Scholar*, 5, 1979, 7-16.

Wallis, R. (ed.) 'On the margins of science', *Sociological Review Monograph* 27, University of Keel, 1979.

Warner, L. 'A second survey of psychological opinion on ESP', *J.O.P.*, 16, 1952, 284-295.

Warner, L. and Clark, C. 'A survey of psychological opinion on ESP', *J.o.P.*, 2, 1938, 296-301

Wheatly, J.M.O. and Edge, H.L. (eds.) 'Philosophical dimensions of parapsychology', Illinois 1976.

Magne Dybvig,
The University of Trondheim,
Department of Philosophy,
N-7055 Dragvoll,
Norway