Telepathy

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This paper has three parts. In the first part I attempt to clarify the concept of telepathy, describe some of its outstanding features, and indicate its connection with other parapsychological concepts. In the second part I consider data obtained in some of the better recent studies in telepathy. And in the final part, I argue that a familiar sort of physicalistic/mechanistic theory cannot possibly explain the phenomenon of telepathy—or, for that matter, any form of human communication.

I

Let us begin with some terminological matters. Literally, 'telepathy' means 'feeling at a distance', and one might think that we should begin our study simply by making this definition more precise. But as Broad has observed (in 'Normal Cognition, Clairvoyance, and Telepathy' in [2]), the term 'telepathy' is ambiguous. Broad argues that we must distinguish telepathic *cognition* from telepathic *interaction*. The latter may presumably occur without the former, although the converse of this is presumably not possible. So let us tentatively define 'telepathic cognition' as 'the knowledge of another person's thoughts or mental states gained independently of the five senses'. How, then, should we define 'telepathic interaction'? Broad defines it as 'the supernormal causal influence of one embodied mind on another' ([2]: 48). But this is not quite satisfactory. Two terms in Broad's definition seem initially problematical—namely, 'supernormal' and 'mind'. We needn't worry about the second of these, however. We can presumably talk about minds without presupposing any philosophical analysis of what minds are. Moreover, we can ignore Broad's Cartesian reference to *embodied* minds. At this

stage, dualistic assumptions are gratuitous. The use of the term 'supernormal', however, is somewhat more suspicious. At least initially we should leave open the possibility that telepathic interaction occurs by means of processes which are neither different in principle from nor simply more extraordinary than those currently recognized by science. If the use of the term 'supernormal' is intended to rule out this possibility, it therefore begs an important question. But if it does not rule out this possibility, then it is not clear what the term could mean. (I have explored possible analyses of the presumably synonymous term 'paranormal' in [1].)

I think we can avoid this problem with Broad's definition. The possibility of telepathic interaction derives much of its interest from the fact that we normally assume that a person's mental state cannot produce a change in another person's mental state except by means of processes which at some point involve the operation of one or more of the familiar five senses. We believe, for example, that my present mental state can cause a change in yours only by means of a causal sequence which at some point involves your sensory contact with your environment (cf. Broad [2]: 46). First my mental state must issue in some overt behavior or other publicly observable state of mine. Then this behavior or state must ultimately have some effect on your body, and thereafter produce some change in your mental state. For example, I could change your mental state by talking directly to you, or by your hearing or reading my recorded or written words (or copies of these), or by your observing my expressions, gestures, etc. (or by your observing or being affected by reproductions of these), or by your coming into contact with some object or artifact I produced or used (or reproductions of these).[1] One reason telepathic interaction is interesting, then, is that the telepathic process is supposed to operate independently of the familiar sensory mechanisms involved in these sorts of complex causal chains. We may thus tentatively define 'telepathic interaction' as 'the causal influence of one mind on another without the intervention of the five senses'.

Although there is not really a philosophical tradition with respect to the subject of telepathy, most philosophers writing on telepathy have focused on the possibility of one person telepathically coming to *know* what someone else's mental state is. The supposition that telepathy fundamentally concerns this sort of cognitive process is one reason, I think, why tele-

pathy is usually considered to be a form of extrasensory *perception*. But this is at least a partially, and perhaps wholly, misleading way to approach the topic of telepathy. We will shortly consider evidence which suggests strongly that there are interesting forms of telepathic interaction which would not properly be described as cases of telepathic cognition. For example, there is evidence suggesting that a person's mental state can be causally efficacious in producing a *similar* mental state in someone else, independently of channels of communication involving the five senses. Thus, *A*'s thought of the Queen of Spades might produce in *B* the thought of the Queen of Spades, or the Queen of Hearts, or Queen Elizabeth. And as we shall see, the possibility of this sort of interaction alone raises important philosophical problems, even though we would not describe such cases as cases of one person telepathically coming to *know* what another person's thought or mental state is.

In fact, most (if not all) of the best evidence supporting the existence of telepathic processes concern cases which suggest telepathic interaction but not telepathic cognition. Many of these are of the sort just mentioned—that is, cases in which an agent's mental state appears to produce a similar mental state in someone else. Let us refer to these as cases of *ostensible telepathic content-simulation*. Clearly, once we grant that there might be telepathic processes in which one person's mental state produces a similar mental state in someone else, and once we grant that these cases need not be described as cases of the latter person knowing telepathically what the mental state of the former is, then even if the mental states of the two people were qualitatively *identical* (although we have no evidence for anything like this), this would not compel us to describe the second person as knowing the mental state of the first. This would simply be a limiting case of telepathic content-simulation. In the language of Information Theory—which is often employed to describe paranormal goings-on—this would be the analogue of the transmission of a signal in the absence of noise. Some other studies suggest that subjects exhibit subtle physiological responses to telepathic stimuli even though they are not consciously aware of any such interaction. These cases likewise suggest the existence of telepathic interaction rather than a form of cognition, and may be classified as cases of *ostensible pre-conscious telepathic interaction*. Some of the much-debated cases of card-guessing may also

fall into this category, since subjects report that guesses are not based on conscious subjective experiences of the identity of the target. Most of the remaining good cases suggesting the existence of telepathy are cases of *ostensible hypnogenic telepathic interaction*. These concern such phenomena as the inducing of hypnotic trances at a distance, apparently by means of telepathic command or suggestion. Here, too, we seem at best to have a form of telepathic interaction, but no telepathic cognition.

Parapsychologists often contrast the term 'telepathy' with 'clairvoyance'. Whereas telepathy is supposed to involve a causal sequence between two minds, clairvoyance is supposed to involve a causal sequence running from some physical state of affairs to a mind. Usually this distinction is taken to be a distinction between two forms of cognition. Whereas the object of telepathic cognition is supposed to be a person's thoughts or mental states, the object of clairvoyant cognition is taken to be a physical state of affairs. Understood in this way, it is obvious that telepathy could turn out to be a special case of clairvoyance—if, that is, mental states are nothing more than certain kinds of physical states of affairs. Conversely, if some form of idealism is true, then clairvoyance could turn out to be a special case of telepathy. In the absence of a thoroughgoing metaphysics, however, we may tentatively accept the distinction between telepathy and clairvoyance.

There is, however, a different way to challenge the distinction between clairvoyance and telepathy as it has been drawn thus far. It is a familiar fact that we often come to know another person's mental state from observations of his bodily states (e.g., behavior, gestures, expressions, etc.). But if we can *clairvoyantly* come to know *these* things about a person, then we can clairvoyantly come to know a person's mental states. This problem is not difficult to resolve, although we may not be able to resolve it at this stage with consummate clarity. However precisely we would describe the difference between, on the one hand, a person A knowing what his own mental state is, and, on the other, a person B coming to know A's mental state after observing A, we can at least provisionally describe B's knowledge as *phenomenologically indirect* as compared to A's self-knowledge. Similarly, we may say that clairvoyant knowledge of a person's mental state would be phenomenologically indirect as compared to telepathic knowledge of that state. Let us therefore provisionally redefine 'telepathic cognition' as

'the phenomenologically direct knowledge of another persons's thoughts or mental states'.

Before finally considering some details about experimental data, I should point out that there is one more way of challenging the distinction between telepathy and clairvoyance. But this concerns the larger issue of *experimental purity* in parapsychology, and this issue is important independently of the subtleties of the definitions advanced thus far. Traditionally, parapsychologists have classified so-called *psi* phenomena into the familiar categories of telepathy, clairvoyance, precognition (and retrocognition), and PK (psychokinesis), and many recognize that these categories may not mark off mutually exclusive classes of phenomena. For example, clairvoyant and telepathic cognition may also be precognitive (more on this shortly). Nevertheless, parapsychologists have often tried to design experiments that would test for phenomena in one and only one of these categories, and their almost total lack of success suggests that there may be, as some have maintained, some very general psi phenomenon having a variety of manifestations (labelled 'telepathy', 'clairvoyance', etc.). Rhine, in fact, called this general phenomenon 'GESP' for *general* ESP.

The sort of problem faced in achieving experimental purity in telepathy experiments can be easily illustrated by considering some difficulties confronting researchers at the end of the 19th Century and the first several decades of the 20th Century. In some ESP tests, one person (the *agent*) would concentrate on a drawing or a card, and another person (the *percipient*), separated by some means from the agent, would at a specified time try to reproduce the drawing or identify the card. Some of these tests yielded apparently impressive results, and these results were seen as indications of the existence of mental suggestion—until, that is, it was found that equally impressive results could be obtained even when no agent had concentrated on the drawing or card in advance. Researchers consequently realized that the earlier experiments in thought-transference had been ambiguous. If they indicated the existence of some new or unexplained phenomenon, it might have been clairvoyance rather than telepathy. In fact even the later experiments—those appearing to test only for clairvoyance—were plagued by a similar kind of ambiguity. The impressive results of these tests could in principle be explained as resulting from the *precognitive* knowl-

edge of the subsequent recording of the order of the cards in the unexamined deck or the subsequent examination of the sealed envelope containing the target drawing.

This dilemma highlights the principal difficulty in designing pure telepathy experiments. In order to insure that extraordinary external influences on the percipient's mental state originate in the mind of the agent, it is crucial to avoid recording the target objects or the score of hits and misses. So long as a record exists of what the target objects are or which guesses were successful, impressive test results can always be attributed to some phenomenon other than telepathy. An experiment of this sort was actually carried out (see McMahan [13]), and did not yield very impressive results. Moreover, even an impressively successful test of this sort, in which no recorded account of targets and guesses is permitted, is unlikely to satisfy those determined to test for psi abilities under strict controls. Strict experimental controls must presumably be public in a way ruled out from the start by such tests.

Still, even if we grant the fact of experimental ambiguity and the possibility that telepathy may be but one manifestation of some more general psi phenomenon, what matters for our purposes is that there is evidence suggesting various kinds of causal interaction between human beings occurring independently of known sensory processes. And apart from the subtleties of parapsychological taxonomy, this evidence merits serious attention.

Although a really detailed summary or evaluation of the data on telepathy is clearly out of the question in this paper, I want to focus briefly on four sources of evidence: (a) The quantitative experiments in card-guessing; (b) The Maimonides Hospital experiments; (c) Dean and Nash's plethysmograph experiments; and (d) Soviet studies in hypnogenic telepathic interaction. Anecdotal material is also very interesting, and the reader is directed to Stevenson ([29]) for a systematic examination of such material.

II

(a) Experiments in Card-guessing. These quantitative experiments were designed primarily to establish conclusively the existence of some psi phenomenon by showing that a person could, under controlled conditions, correctly identify concealed target objects with a frequency greatly exceeding that

expected on the hypothesis of chance. These tests generally were designed to test for clairvoyance or GESP rather than telepathy.

The astronomically high odds against the numbers of successful guesses ('hits') obtained in some of these tests have inspired criticisms of various sorts. In fact, the mere appearance of success in parapsychological experiments generally has often come under fire.[2] I cannot explore the issues here in all their detail, but a few brief remarks should be helpful. Of the criticisms typically leveled against the field of parapsychology as a whole, perhaps the least serious concerns the integrity of the experimenters. Since successful quantitative experiments have been conducted by scores of researchers in different parts of the world, those critics who insist that many or all positive ESP scores are explainable as due to chicanery have found themselves impugning the characters of an unreasonably large number of respected persons, or else have been driven to advance a ludicrous 'conspiracy' theory. Granted, some cases of experimenter fraud have been uncovered, but the parapsychological community seems very sensitive to this issue, and appears open and responsible in its housecleaning.[3]

A more serious form of criticism concerns the integrity of the experimental designs themselves. Some have maintained that the test conditions permitted sensitive subjects to pick up extremely subtle sensory cues which would account for their outstanding scores. Furthermore, some have objected that the selection of target objects for these tests is suspect, and that the ordering of targets is not genuinely random. It is generally conceded that a number of the more successful experiments of this century are vulnerable to these criticisms, even if the suggested alternative methods of information-acquisition seem rather far-fetched. Recent and ingenious experimental designs, however, have robbed this line of argument of much (if not most) of its force. Helmut Schmidt (see [22]-[25]) designed a series of experiments in which target objects were selected by a random quantum process, the decay of a piece of strontium 90, and in which the number of hits and misses in the trials was recorded mechanically. Schmidt's machines contained further safeguards against cheating and carelessness (e.g., to prevent the subject from making two simultaneous guesses), and while these devices were not used to test for telepathy, the results obtained with them suggest strongly that

good scores in parapsychological experiments are possible under unimpeachable conditions, or conditions at least as good as those demanded in more orthodox areas of scientific inquiry.

Of course this is not the place to consider fully the soundness of experiments in parapsychology, not to mention the thorny issues of the extent to which strict experimental controls and experimenter-subject interaction (normal *or* paranormal) might inhibit performances in tests for human aptitudes or abilities. But I do think it is fair to say that numerous provocative experiments have been conducted in good faith by competent scientists under *prima facie* reasonably strict experimental controls, and that the results of these experiments deserve to be taken seriously, and that the implications of these results deserve to be explored.

Returning, however, to the card-guessing experiments, some people, impressed by the fact that statistical methods have been correctly employed in these experiments, but skeptical about the existence of psi abilities generally, have suggested that something may be awry in the foundations of probability theory (see Spencer Brown [28] and Hardy, *et al* [6], for discussions of this issue). This is an intriguiging idea, but it cannot be examined here. In fact, I will suppose in this paper (if only to see where it leads us) that with respect to successful quantitative parapsychological experiments, we have more grounds for questioning received views about the limits of human abilities than we have for questioning the axioms of probability.

I should add that we must exercise caution in interpreting the statistically significant results of quantitative ESP tests. In most tests, significant positive deviations from mean chance expectation are not so phenomenal as they were, for example, in the Pearce-Pratt clairvoyance tests at Duke University. In this series of 1,850 calls (74 packs of 25 Zener [ESP] cards were used), Pearce made 558 hits, 188 above mean chance expectation. These results have a probability $p < 10^{-22}$ (see Rhine [19]). More frequently, however, the odds against successful ESP scores are on the order of 1000 to 1. Furthermore, some recent studies in the matching of digits from random number tables produced deviations comparably significant in a series of over 70,000 pairings. These pairings, moreover, tended to occur in patterns similar to so-called *position* effects, whereby the percipient tends to score better in specific segments of the

trials—say, in the first and last parts of the run (see Hardy, *et al* [6]). Balancing this out, however, in an experiment conducted in the 1930's, shuffled decks of ESP cards were matched against each other to simulate ESP tests. One deck would represent the targets and the other deck would represent the guesses. In more than 100,000 pairings of this sort the number of 'hits' was *not* statistically significant (see Warner [40]). Before reaching hasty decisions regarding the significance of quantitative ESP scores, it seems advisable to arrive at an understanding of these various results.

Although quantitative experiments have provided dramatic *prima facie* evidence for clairvoyance or GESP (e.g., the Pearce-Pratt experiments), the most dramatic evidence of this sort for telepathy is shrouded in controversy. The experiments in question are those conducted by S. G. Soal (see Soal & Bateman [27] and Broad [3]). Soal varied the test conditions between those in which telepathy was permitted and those in which it was apparently excluded. In the former cases, the agent would turn up and look at the face of the card to be identified by the subject. In the latter cases, the agent simply touched the back of the card to be identified. In these tests it was found that two star subjects, Mr. Shackleton and Mrs. Stewart, did very well under the conditions permitting telepathy (the odds against Mr. Shackleton's scores, for instance, were 3.88×10^7 to 1), while there was no interesting deviation in those tests excluding telepathy. Moreover, in a different series of experiments with Shackleton carried out only under conditions permitting telepathy, the odds against getting so many hits (1,679 out of 5,799 calls) is 2.4×10^{63} to 1. Recently, however, evidence has been surfacing that Soal may have doctored some of his results,[4] and while this evidence is perhaps not conclusive, it nevertheless casts enough doubt on Soal's experiments generally to force us to look elsewhere for persuasive evidence for telepathy. Let us now consider that evidence.

(b) The Maimonides Hospital Experiments. In recent years the Division of Parapsychology and Psychophysics at Maimonides Hospital in Brooklyn has conducted some pioneering experiments in parapsychology which bear on the present topic. Unlike experiments in card-guessing, where percipients generally report having no outstanding subjective experiences,

the Maimonides tests aim at producing experiences in the percipient like those reported in anecdotal cases (see Stevenson [29], and also Gilbert Murray's description of his own apparent telepathic experiences in Smythies [26]). Moreover, one of the outstanding features of the anecdotal reports of apparent psi experiences is that such experiences tend to occur when the subject is relaxed or asleep, when arresting external sensory stimuli are presumably at a minimum. For this reason, subjects in the Maimonides experiments are tested under similar (albeit more artificial) sorts of conditions.

The original series of Maimonides experiments tested sleeping subjects, and although several different experimental designs were used (see [12], [35]-[38]), they are for the most part variations on the following experimental plan. The subject goes to sleep, wired to an EEG machine. When the EEG machine indicates that the subject has entered the REM period of sleep, an agent, isolated from the subject, is alerted to begin concentrating on a randomly selected target object (like a famous painting or a photograph). When the subject is finished dreaming, he is awakened by the experimenter and his verbal account of the dream is recorded. This procedure is carried out for each of the subject's REM periods during the night. Then in the morning, the subject is asked to relate whatever overall impressions he has of the night's dreams. This entire procedure is repeated over a series of nights. When the trials are completed, the transcripts of the subject's remarks, along with copies of the pool of possible target objects, are sent to independent judges who are asked to match each of the subject's verbal reports, on a blind basis, with the series of target objects and to rank the target objects according to their degree of correspondence with the content of the reports. The subject himself is also asked to match his dream reports with the targets.

Recent variations on this technique test subjects, not during sleep, but during an artificial state known as *Ganzfeld stimulation*, in which the subject listens to white noise in headphones and has ping-pong ball halves covering his eyes, thereby presenting him with a relatively homogeneous and hopefully non-distracting auditory and visual field. Then the subject, located in an electrically-shielded sound-attenuated room, reports his spontaneous mental acitivity in an attempt to describe the contents of a randomly selected target picture being viewed by an agent in a non-adjacent sound-attenuated

room. The subject's reports are recorded via intercom by an experimenter located in the monitoring room adjacent to the subject's chamber. The monitoring experimenter is blind as to the identity of the target picture. After the subject has given his mentation report, he then ranks the pool of target pictures in order of correspondence to his mentations. A recent variation on *this* method, involving binary coding of the content of the target pictures, has also been successfully employed. This procedure is complicated, and the interested reader is directed to Honorton [7], [8], and to Terry and Honorton [34] for details, and for an overview of the work with Ganzfeld stimulation. In yet another recent innovation (from which data are still being collected), the agent and subject try, *before* the experiment, to attain comparable levels of relaxation by simultaneously attempting to influence the output of a biofeedback machine.

One obvious problem in comparing free response material to target pictures is the difficulty of distinguishing partial hits from misses. This problem is especially acute in cases where the subject seems to transform the target material symbolically or in ways corresponding to his psychological idiosyncracies. But despite these hazards, the Maimonides experiments have yielded provocative results. Not only has blind judging been successful in the dream studies, but the later studies in Ganzfeld stimulation have been successfully replicated at Maimonides and elsewhere (see [7], [34]). Moreover, the Maimonides experiments generally have been most successful in cases where the subjects have been selected on the basis of successes in previous studies, suggesting, as one might have expected, that the requisite psi abilities may be possessed in varying degrees of refinement. Granting the integrity of the experimenters and experimental designs, this difference between the performance of unselected and selected subjects would be considerably more mysterious on the assumption that there is no ESP.

Furthermore, in the dream studies the subjects were frequently able to match targets with reports more successfully than the independent judges, even when the judges were successful in their own scoring. This disparity between the subjects' and judges' abilities to match targets to reports is what one would have expected, on the assumption that the subject would be more intimately aware of the nature of his telepathic experiences and of subtle correlations between his

experiences and the targets, than would anyone to whom he might try to relate those experiences. Thus a sympathetic interpretation of this fact would be that there *was* telepathic interaction between agent and percipient, and that either the percipient did not report all that he was able to articulate, or that the percipient simply was unable to verbalize part of his experience, perhaps because he did not know how to express it, or perhaps because a portion of the telepathic experience was felt or retained only on a subliminal or subconscious level.

The scope of this paper does not permit a discussion of the statistical methods employed to determine the probability of free responses of the sort collected in the Maimonides tests. In addition to the specific techniques used by Honorton, the reader is directed to Morris [14] for a theoretical discussion and to Puthoff and Targ [18] for an application of Morris' method. Still, focusing now just on the dream studies, let us consider briefly what sorts of correlations between target objects and dream reports emerged in the Maimonides experiments. In general, these studies support the widespread idea that in telepathic interaction the percipient's experience tends to be a distorted or partially correct representation of that of the agent, and also that the percipient often wrongly interprets what he experiences (Targ and Puthoff call this 'analytical overlay'). For example, agent A's experience might be of a man standing before a row of trees. But percipient B might turn unimportant elements of A's experience into important elements of his own, for example by experiencing a row of trees with a man behind them in the distance. Or, B might distort elements of A's experience by having an image of a man standing before the bars of a cage. Or, if A experiences a man waving frantically for help, B may have an image of a man waving and interpret it as an image of someone waving a friendly greeting.

To take a real case, in one of the Maimonides trials, the agent, and orthodox Jew, concentrated on a print of Chagall's *The Yellow Rabbi*, in which an old rabbi sits at a table with a book in front of him. The subject for the experiment was a Protestant. In one dream he saw a man in his 60's riding in a car. In another he reported 'a feeling of older people. The name of Saint Paul came into my mind'. In another he dreamt of a professor of humanities and philosophy reading a book. In the summary of his dreams the next morning, the percipient reports, 'So far, all I can say is that there is a feeling of older

people. . . The professor is an older man. He smoked a pipe, taught humanities as well as philosophy. He was an Anglican minister or priest' ([38]: 112). The apparent conversion of Jewish images to secular or Protestant or Catholic images is typical of the sorts of apparent distortion that occurs in these cases. It has led some researchers to suggest that telepathic information is received unconsciously or subconsciously, and then must surface to consciousness by passing through a sort of filtering system having to do with the person's general emotional or psychological background and dispositions.

(c) Pre-conscious Telepathic Interaction. We have laboratory evidence from various sources that persons can exhibit subtle physiological responses to remote stimuli. Some of this evidence, moreover, seems to point to a kind of pre-conscious telepathic interaction. The majority of the evidence, though, seems more convincing as evidence for clairvoyance. For example, Targ and Puthoff ([30], [31]: 130-33) found significant variations in the EEG of a subject in a shielded room, which corresponded to the flashing of a light in another laboratory. Initially, the test was conducted with an agent (sender) observing the light flashes. But Targ and Puthoff found that the subject's EEG continued to vary according to the time of the flashes even when no agent was present (see Tart [33] for a similar sort of study).

The series of experiments which suggest telepathic interaction were conducted by E. D. Dean and C. B. Nash (see Dean [5]). The experimenters used a plethysmograph to measure blood volume changes in the subject's finger. In the original series of experiments conducted by Dean, an agent in a room adjacent to that of the subject viewed cards with names written on them. Some of these names were of persons known only to the subject, while others had names of persons known only to the agent, and still others had names selected from the telephone directory. For an additional control measure there were some periods in the experiment where the agent viewed blank cards. The measurements of the plethysmograph were done on a double-blind basis, and showed that the subject names were associated with larger vasoconstrictions than were the agent and neutral names and the blank cards (the magnitude of whose associated vasoconstrictions is about the same).

In a follow-up series of experiments conducted by Dean and Nash, which in general supported the results of the first series, the experimenters confronted an interesting problem which in turn led to some interesting observations. For each of a protracted series of trial runs the subject had been asked to submit five new names, and it was not long before he ran out of names to use. Initially, the experimenters dealt with this problem in subsequent trials by randomly selecting names from the pool already given by the subject. But the results of all these trials did not confirm Dean's earlier experiment. The experimenters then reviewed the successful names used, and found that they were names of people with whom the subject had been in contact recently, or for whom the subject had strong feelings or associations.

Dean and Nash accordingly altered the process of selecting names so that the subject-names had at least one of these features, and this time they found significant vasoconstrictions when the agent viewed names of persons known to the subject. Moreover, they found that the subject showed significant vasoconstrictions when the names viewed were of persons recently contacted by the *agent*, and nonsignificant vasoconstrictions when the agent-names were of people *not* recently contacted.

It may be significant also that one of the names given by the subject was of a person he saw almost every day, and that out of the 43 times the name was viewed by the agent, the subject showed large vasoconstrictions 38 times. Moreover, one of subject's largest vasoconstrictions occurred when the agent viewed the name of the subject's two-day old baby.

(d) Hypnogenic Telepathic Interaction. Russian experiments in telepathy were originally intended to garner evidence for materialistic theories of the mind. Soviet scientists hoped to uncover the physical or physiological mechanisms responsible for telepathy, and in fact hoped to confirm the brain-radio model of telepathy by finding its electromagnetic origins in the brain. To this extent their results were somewhat less than hoped for, since their apparently successful demonstrations of telepathy suggest that telepathy is insensitive both to distance and to electromagnetic shielding. Experiments that proved successful at short distances and in the absence of

shielding proved comparably successful at long distances and under conditions of shielding.

Adrain Dobbs (see Smythies [26]), among others, has observed that these unexpected results do not completely rule out electromagnetic theories of telepathy. The evidence for the effects of distance on telepathy is not precise enough to warrant the conclusion that telepathy does not obey the inverse square law, for example. There is also the possibility that the atmosphere may, for some reason, act as a superconductor for telepathic waves. Moreover, the shielding employed would seem to rule out only familiar forms or wavelengths of radiation. In fact, I. M. Kogan of the USSR has argued that these *prima facie* anomalous results, plus familiar results like the observed low degree of information apparently conveyed in ESP tests, are compatible with the hypothesis that telepathy results from the transmission of extremely low-frequency (ELF) waves in the 300-1000km region (see [9]-[11]). On the other hand, Puthoff and Targ [18] argue that there remain significant problems with this hypothesis.

I prefer not to pursue this issue, since as I argue in the next section, electromagnetic theories can be ruled out *a priori*. The Soviet studies are especially valuable for their novel approach to demonstrating the reality of telepathy. The premier investigator of telepathy in Russia was the late L. L. Vasiliev (see [39]), chairman of the Physiology department at the University of Leningrad. In his earliest experiments, Vasiliev attempted to test for telepathy as a means of inducing motor responses (like arm or leg raisings) or sensory images. But he rejected these methods because of the difficulty of distinguishing partial successes from misses (as the Maimonides tests have likewise demonstrated).

During the 1920's and 30's, Vasiliev and his colleagues employed numerous experimental designs. A typical experiment is as follows. The purpose of this experiment was to see if the onset of either natural sleep or auto-hypnosis could be accelerated by means of mental suggestion. The subject for the experiment was alone in a room, and the agent was alone in an adjacent room. The subject was instructed to compress rhythmically an air compression balloon and to cease this activity with the onset of drowsiness or sleep. The air compression balloon was connected to a kymograph, which recorded the rhythm and intensity of the pressure. The agent used a rotating wheel with black and white disks to determine

if he should try to induce sleep in the subject by means of mental suggestion. If the wheel stopped rotating on a white disk, no suggestion was sent. If the wheel stopped on a black disk, the agent immediately began trying to induce sleep in the subject and would cease when the curve on the kymograph stopped fluctuating. The time elapsed between the stopping of the rotating wheel and the onset of sleep was recorded. This experimental technique was used with four subjects, in the evenings between 7 and 11 p.m., in illuminated rooms. A total of 53 experiments were completed, 26 of which did, and 27 of which did not, involve the attempt to induce sleep in the subject. Without mental suggestion to go to sleep, the average time for the onset of sleep was 17.7 minutes (with an average error of ± 1.86 min.). *With* mental suggestion to go to sleep, the average time for the onset of sleep was 6.8 minutes (with an average error of ± .54 min.). It thus took almost three times as long for the subjects to fall asleep in the absence of mental suggestion. Subsequent experiments provided similar evidence for telepathic interaction under conditions of lead screening.

In order to test the sensitivity of telepathy to distance, and also to rule out completely the possibility of hyperaesthesia of hearing frequently observed in hypnotised subjects, some experiments were conducted from Sebastopol to Leningrad (approx. 1,700 km). Although only two experiments were conducted at this distance (several others were conducted at distances from 25 meters to 7,700 meters), the results are very interesting. Days and times for the experiments were arranged in advance, and agent and observer of the percipient checked their watches by radio with Moscow time. The agent, incidentally, also had an observer, and he was ignorant of the purpose of the experiment. On the first day for the planned experiment, the agent (unknown to his colleagues back at the Institute for Brain Research in Leningrad) became ill and did not attempt mental suggestion. For the planned two hours between 5 and 7 p.m., the percipient showed no signs of sleepiness. Two days later the same subject returned to the laboratory in Leningrad at 10:00 p.m. At 10:10 the agent began to try to induce sleep in the subject. At 10:11 the subject entered a hypnotic state. At 10:40 the agent tried to awaken the subject and precisely at 10:40 the subject came out of hypnosis (see Vasiliev [39]: 152-3).

The long-distance tests are, of course, preliminary in nature, and they invite various refinements in design, some of which were planned when Vasiliev wrote his book. Nevertheless, Vasiliev's experiments are suggestive and deserve attempts at replication.

III

We have considered *prima facie* evidence for different forms of telepathic interaction. Notice, though, that even if this evidence points conclusively to the existence of telepathic phenomena, it still affords us no way of deciding whether these apparently distinct phenomena are all instances of some one general underlying process. For example, hypnogenic telepathic interaction may simply be a form of PK, and telepathic content-simulation may be something altogether different, or perhaps a complicated form of PK. On the other hand, it may be that neither should be regarded as a form of PK, and that hypnogenic telepathic interaction is a special form of content-simulation. For example, the two seem analogous in that they both require one person to produce a mental state in another similar to his own. The agent (transmitter) in the Soviet experiments was instructed to"reproduce with the greatest possible vividness feelings usually experienced when falling asleep, and to associate these feelings with the image of the percipient while mentally conveying the command 'go to sleep!'" ([39]: 110). Moreover, as far as the command to go to sleep in concerned, putting someone into a state of hypnotic sleep by a distant command might be analogous to commanding a hypnotized person in the same room to go to sleep, in that in both cases it is as if an instruction must be properly understood by the subject. And to the extent that the positive results of Dean's experiments point to the reality of telepathy, it seems as though the subject has some sort of pre-conscious awareness of the name the agent is concentrating on. We may not want to go so far as to say that the subject *knows* what the agent is concentrating on. But it at least seems that the mental states of the agent and subject would be alike to the extent that they are both focused on a certain name. In any event, since the hypnogenic and pre-conscious cases might be analogous in these respects to the content-simulation cases, and since the sorts of cases which historically have aroused the greatest interest in telepathy are those of appar-

ent content-simulation, let us consider briefly some issues concerning the explanation of this phenomenon.

The position I want to defend in this section is that no version of what we may call the *energy-transfer* theory[5] of telepathy (hereafter, *ET* theory) can explain telepathic content-simulation. The *ET* theory of telepathy is a theory which attempts to reduce telepathic processes (including content-simulation) to a certain kind of mechanical physical process between agent and percipient. According to this theory, a case of telepathy can be fully analyzed as a sequence of events beginning with some state of the agent and terminating in the production of some state of the percipient. Different versions of the *ET* theory construe this process somewhat differently. For example, to whatever extent mental events figure into this process, such events may be regarded as brain states or epiphenomena. And as far as the *mechanism* of telepathy is concerned, telepathy is usually regarded as a process fitting familiar electromagnetic models, where the sequence of events begins in the agent's brain, continues through the intervening medium between agent and percipient, and terminates in the brain of the percipient. In fact, the typical model for telepathy is that of radio transmission. As C. T. Tart has observed (in [32]), this model has some attractive correlations with what appear to be experimentally established facts about telepathy. For example, just as tubes in receivers and transmitters need time to warm up and circuits need time to stabilize, subjects often have to 'warm up' by getting themselves into the appropriate frame of mind for the experiment. Moreover, just as a radio signal will be received from a certain transmitter only when the receiver is tuned to the appropriate frequency, not all pairs of subjects in telepathy experiments seem able to interact telepathically. And just as some transmitters are more powerful (or receivers more sensitive) than others, certain people are better than others as agents (or percipients). And just as radio signals can be distorted by various processes, telepathically communicated material seems to undergo kinds of distortion (as the 'signal' of an old rabbi may be distorted into that of a priest). The idea that telepathy can be reduced to some such mechanical process is presupposed by the increasingly familiar assumption that the language of Information Theory is adequate to express the relevant features of telepathic processes (see Kogan [9]-[11], Ryzl [21] and Puthoff & Targ [18]).

It is possible, I suppose, to offer a mechanistic theory of telepathy which is not a purely physicalistic theory (where we understand the domain of the physical to be the domain of phenomena currently countenanced by orthodox physical theory). There may be, in other words, mechanistic dualistic or idealistic theories. But the *ET* theory has traditionally been couched in the presumably safe terms of current physical theory. In fact this is why this theory is appealing to many of those willing to entertain the possibility of telepathy in the first place. By opting to stick with familiar scientific descriptive categories, rather than attempting to explain telepathy in more metaphysically exotic, if not downright mystical, terms, the *ET* theory displays an attractive kind of scientific and ontological conservatism. For the purposes of this paper, then, I shall discuss the *ET* theory insofar as it is a metaphysically parsimonious physicalistic theory. Presumably, though, the arguments I deploy below against this kind of mechanistic approach to telepathy would apply, *mutatis mutandis*, to other mechanistic approaches as well—for example, the dualistic claim that the causal sequence between agent and percipient has stages where a mental event produces a physical event (or conversely).

Opposing the *ET* theory of telepathy is, of course, nothing new. But discussions of the merits of this theory have usually concentrated on such features of telepathic interaction as its alleged insensitivity to distance or electromagnetic shielding. The fatal flaw in the *ET* theory, in other words, is typically claimed to be its incompatibility with experimental data pertaining to telepathy. And as Dobbs has argued in his very good paper, the case for this is quite weak (see Smythies [26]). The problems I want to raise, however, are more abstract, and concern *any* attempt to reduce any form of human communication to processes like those posited by the *ET* theory. The special features of the telepathy case simply throw these general problems into sharp relief.

First, let us be clear about what needs to be explained by the *ET* theory. The situation we want to explain is one in which a thought of a certain kind in *A*—let us say a φ-thought—produces a similar thought in *B*. This might be another φ-thought or some ψ-thought, where the properties φ and ψ are such that φ-things and ψ-things would be widely acknowledged to be similar in some obvious respect. For example, *A*'s φ-thought may be of an old rabbi, and *B*'s

thought could be of an old rabbi, or of a young rabbi or a priest. We needn't suppose that *B*'s ψ-thought is anything so tangentially similar to the thought of an old rabbi as would be the thought of a snake charmer, or the thought of a clam, even though old rabbis and clams (say) share numerous properties. In the case where *A*'s thought is the thought *that*. . . (rather than the thought *of*. . .), we must state this situation somewhat differently. If, for example, *A*'s φ-thought is the thought that S is φ, then what needs to be explained is how this thought produces in *B* the thought that S is φ, or some thought obviously related to the thought that S is φ, such as the thought that S is ψ, where the properties φ and ψ are as explained above. For instance, *A* might think that Jones has a fever, and *B* might think the same thing, or he might think simply that Jones is sick, or that Jones has a headache. Of course these two ways of characterizing thoughts are not mutually exclusive. *A*'s thought *that* S is φ is also a thought *of* S. But the relevant similarities between the thoughts of *A* and *B* can be of either sort.

The major difficulties with the *ET* theory of telepathy concern its attempt to explain why these sorts of similarities between the thoughts of agent and percipient are not fortuitous. The reason people investigate telepathy in the first place is that there is reason to believe that a person's thoughts sometimes produce similar thoughts in another person, as *A*'s old-rabbi thought might produce in *B* the thought of an old rabbi or the thought of a priest. Although, from the point of view of the *ET* theory, the evidence suggests that the transfer of information from agent to percipient is often distorted by 'noise' or modified by some sort of filtering system, what is initially of interest to the theoretician is the *ideal* case where no such impediment to information transfer obtains. And the reason this case is interesting is that even if we knew how one person's thought might produce a thought in someone else by means of an energy transfer independent of known sensory processes, we wouldn't feel that we have fully explained the phenomenon of telepathy unless we could specify the process by which thoughts of a certain *kind* produce thoughts of a similar *kind*.

Any explanation of telepathy, then, must explain more than how one person's thoughts may produce a thought in someone else independently of the five known sensory channels. It must also explain how agent and percipient think *of* or

about the same thing. It must, in other words, explain what we may call *semantic* regularities between thoughts of agent and percipient—for example, that *A* and *B* both think of old rabbis, or that they both think of rabbis (never mind their age), or that they both think of men of God. So if the *ET* theory is a theory of telepathy, it must be able to analyze these semantic regularities as being parts of the process of energy transfer between agent and percipient. And to do this it must presumably identify a person's thought with, or causally trace the thought back to, some one of his physiological states—let's say a brain state. But since this theory must explain certain semantic regularities or similarities between thoughts, it must specify not only which brain states are thoughts, but also which brain-state *kinds* correlate with which thought-*kinds*. If the *ET* theory cannot specify physical regularities corresponding to semantic regularities between thoughts, it will at most have explained only how one person's brain state can produce *some* brain state or other in someone else. But this would still leave it a mystery why a φ-thought might produce another φ-thought, or a related ψ-thought. But it is precisely in this search for physiological, or other physical, correlates to semantic regularities between thoughts that the *ET* theory founders. And it is at this point, moreover, that the question of the viability of the *ET* theory goes beyond the question of its compatibility with the experimental data. H. H. Price recognized this, although he apparently did not see (as we shall see below) that the problems with the *ET* theory are problems facing an entire class of theories designed to explain human communication. Price writes,

> How could a complex proposition or even a complex picture be transmitted by radiation, even if an emotion like fear or anger might be? In the transmission of a message by ordinary telegraphy or wireless, the thought-content of the sender must first be translated into a *code* of some kind, e.g. dots and dashes, or spots arranged in a spatial pattern. Then there must be a series of waves corresponding to these. Then the receiving station reacts to these waves, and translates them back into dots and dashes, or spots; and that again must be translated into words, and finally the words must be understood. Is there any conceivable analogue to all this in the case of Telepathy, especially when we remember that the code of dots and dashes (or whatever it may be) has first to be established by *convention*? ([17]: 113-4)

Price's point is on the right track. But it is not fatal to the *ET* theory, since the energy transfer in question need not be

modeled after some kind of encoding/decoding system, in which case Price's point about the conventional nature of such a system would then no longer apply. We need only suppose that brain states can produce similar states in other brains without the mediation of a coding system (perhaps through some as yet mysterious quantum process). Price, in fact, seems to recognize that a coding system is dispensable in explanations of telepathy when he suggests that 'telepathy is more like infection than knowledge' ([17]: 116). The transmission of an infectious disease is a poor candidate for a coding process, yet when one person catches another's disease, their conditions will be similar in many respects. Of couse we should not take the infection analogy too literally. But it nevertheless reminds us that the *ET* theorist can argue simply that a person's brain states, through some process of energy transfer, might produce similar brain states in another person without the need of any coding system. The brain, they would contend, is a marvelous mechanism, the intricacies of which we are only beginning to grasp. Surely there might be some process in the brain by means of which this kind of energy transfer could occur.

Still, Price comes close to the heart of the matter in emphasising that the *ET* theory will have difficulty in explaining how thought-content might pass from agent to percipient. To see why, we must first observe that any two φ-thoughts can differ in an indefinite number of ways. Forgetting for the moment about the special features of cases of telepathy, let us suppose that *A* and *B* are each thinking about an old rabbi. To keep matters as simple as possible, let us suppose that *A* and *B* both have images of an old rabbi before their minds, although it is clear that their old-rabbi thoughts need not be images at all (*B*, for example, might be recalling a vivid verbal description of an old rabbi). Even though *A* and *B* are both experiencing mental images of old rabbis, it is obvious that these images can differ in numerous respects. For example, *A* might be picturing an old rabbi conducting a bar mitzvah, while *B* might be picturing a rabbi eating a pizza, and as wearing a leisure suit. Now if we suppose that *A*'s old-rabbi thought telepathically produced *B*'s old-rabbi thought, then what must be explained is how one old-rabbi thought can produce another, and one thing the *ET* theory must do is specify what it is about the brain states of *A* and *B* in virtue of which the associated thoughts of *A* and *B* are thoughts of old rabbis. The *ET* theory must in this

way specify physical regularities between the brain states of *A* and *B* which, as it were, cut right through the (possibly dramatic) differences in the associated thoughts of *A* and *B* to whatever it is about those thoughts in virtue of which they are thoughts of old rabbis. And when *B* thinks instead of a young rabbi, or a priest, the *ET* theory must specify physical regularities in the brain states of *A* and *B* corresponding to whatever it is about the thoughts of *A* and *B* in virtue of which they are thoughts of rabbis (never mind their age), or men of God, respectively. Here, the regularity which must be explained is that one rabbi thought *simpliciter*, or one man-of-God thought, produced another thought of the same kind. We must remember that if the *ET* theory cannot specify such regularities between brain states, it cannot explain the most crucial feature of telepathic content-simulation—namely, the striking and *ex hypothesi* non-fortuitous semantic regularities between thoughts of agent and percipient. And as I shall argue below, it is impossible that there by any such physical correlates to semantic regularities between thoughts.

Now in order for the *ET* theory to specify the physical regularities corresponding to semantic regularities between, say, thoughts of old rabbis, the *ET* theory must first specify some brain state (possibly a disjuncitive set of states) such that whenever a person is in this state he is thinking of an old rabbi. This, we may say, is the old rabbi state of the brain, and presumably it is a quite specific state (or set of states), one that would differ from a young-rabbi brain state, or a rabbi brain state *simpliciter*, or a man-of-God state. If the *ET* theory denies this, then it will have no way to specify the distinct causal physical regularities which correspond to the clearly different semantic regularities between thoughts. It will be unable to specify the conditions (or disjunctive set of conditions) under which agent and percipient will have a certain relevant kind of thought.

But at this point it begins to look as though the *ET* theory is forced to take some highly questionable (if not utterly disreputable) stands on some important philosophical issues. To begin with, this theory seems committed to old-fashioned Platonism, which at very least seems an embarrassment to a view which purports to be ontologically austere and scientific. The *ET* theory, we have seen, must postulate the existence of specific physiological states (or sets of states) corresponding to at least some semantic properties of thoughts. Unless they do

this, they will be unable in principle to specify which state-*kinds* correlate with the semantic regularities between thoughts which by hypothesis need to be explained. But these specific physiological states (e.g., old-rabbi or man-of-God states) must correspond to something *in thoughts* if the *ET* theory is to have any content. To suppose that there *is* such a thing as an old-rabbi state (even if this is a disjunctive set of states) is thus to suppose that there is some corresponding genuine property (or set of properties) of thoughts in virtue of which a thought is of an old rabbi. But this is simply to suppose that there is a property (or set of properties) without which a thought would not be of an old rabbi. The more archaic way of saying this is that this property (or set) would be a thought's old-rabbiness.

Some might protest that since the old-rabbi brain state can be a disjunctive set of states, we needn't suppose that the *ET* theory is committed to Platonic essences of thoughts. Rather, a thought could be of an old rabbi if it had this property, or that property, and so on. But notice that even if the old-rabbi state of the brain is a disjunctive set of states, not just any old state can be a member of that set. It will have to be a set with a set of distinguishing characteristics, distinct from those of other sorts of brain states. This, after all, is what will enable future scientists to specify the different sorts of physical regularities corresponding to different semantic regularities in cases of telepathy. Thus the old-rabbi state of the brain must in principle be a state the necessary and sufficient conditions for which are specifiable. But since by hypothesis this state corresponds to whatever it is in a thought in virtue of which that thought is of an old rabbi, the *ET* theory seems committed to the view that there is an essence to the thought of an old rabbi, and moreover that this essence corresponds to some specific physical state or set of states.

Just in case there still beats a heart stirred by visions of the One-Over-Many, I submit the following for consideration. According to the *ET* theory, it is a specific brain state kind (or set of states) that either *is* or *causes* a certain corresponding kind of thought. Moreover, the physiological characteristics of this state which distinguish it from states corresponding to other kinds of thoughts are the physiological correlates to certain semantic properties of thoughts. We may thus pass from talk of what thoughts are *of* or *about* to talk of what brain states (or sets of states) *represent*. For example, the brain state

which either is or causes the old-rabbi thought—the state, in other words, from which future scientists would be able to tell that its owner is thinking of an old rabbi (and not a young rabbi)—is, we may say, the state which represents the thought of an old rabbi (or perhaps which represents an old rabbi). And we have seen that the *ET* theory must claim that there is some set of necessary and sufficient conditions for a brain state to represent one thing rather than another. This is the only way it can hope to specify which state-kinds correlate with which semantic properties of thoughts. Now one further consequence of this, which few seem to have appreciated, is that it commits the *ET* theory to a version of a theory of meaning which in other guises is transparently implausible. According to the *ET* theory, what the content of a person's thought is—that is, whether the person is thinking of an old rabbi, young rabbi, or merely a man of God, depends entirely on what state his brain is in. It will not depend, in addition, on such contextual matters as what the person has been thinking about generally, whether the person's being in this brain state is a response to something in his physical vicinity (e.g., a remark or some other sort of event), or how the brain state gets integrated with the person's previous and subsequent overt behavior. This position is analogous to and as empty as the view that what a well-formed English sentence-token means depends entirely on its (deep and surface) structure and not on such things as what the conversational and larger social context is in which the sentence occurs and how that sentence gets integrated with the rest of the utterer's verbal and non-verbal behavior. Pragmatic elements, in other words, are as indispensable to determining what a brain state represents as to determining what a sentence means.

In order to develop further this parallel between the philosophy of mind and the philosophy of language, we must first make some important observations. To begin with, it is possible that when *A* is thinking of an old rabbi (say) all that is happening in *A*'s mind is that he has an image of an old rabbi. But when *A* is having that mental image he might instead be thinking simply of a man of God, or for that matter of a person *imitating* an old rabbi, or of the robes worn by rabbis. Just as a picture of a collie could in different contexts represent Lassie, or collies generally, or dogs generally, *A*'s mental image of a rabbi could also represent different things in different contexts and thus be a component of different thoughts. And of

course some stage-setting is required for the picture of a dog to represent one thing rather than another. Showing the picture to a child endeavoring to learn the alphabet could be preceded, for example, by 'C is for collie', 'D is for dog', or 'L is for Lassie'. Moreover, the picture of a dog can represent different things without there being any corresponding difference either in the arrangment of elements composing the picture or in the set of conditions which produced the picture. And this means that it is not something *instrinsic* to the picture of a dog that determines what the picture represents in a given case. But the situation is no different in the case of *A*'s image of an old rabbi. First of all, there may be *one and only one* brain state in *A* that either is or causes this particular image of an old rabbi, no matter what the context is in which *A* has this image. But then this brain state is no less ambiguous than *A*'s old-rabbi image. What *A*'s old-rabbi image is an image *of* for *A*, and hence what the corresponding brain state represents, will depend on the sort of stage-setting required to fix the representational properties of the picture of a dog. It might depend, for example, on whether *A* has this image (or brain state) in response to the command 'Imagine to yourself an old rabbi', or 'Imagine to yourself an old man', or 'Imagine to yourself a person imitating an old rabbi'.

Thus, there seems no reason to suppose that a careful and exhaustive analysis of *A*'s brain at a specified time will enable furture scientists to discover what *A* is thinking at that time, any more than a careful and exhaustive analysis of the arrangement of elements of the picture of a dog could be expected to tell us what that picture represents. Whatever is going on in *A*'s mind in context *c* could also be going on in *A*'s mind in some significantly different context *c'*, whose difference would be reflected in the fact that we would properly regard *A* as having different thoughts in *c* and *c'*. But since neurological or biochemical (or whatever, physical) descriptions of *A*'s brain in *c* and *c'* might be identical, the representational properties of *A*'s brain state will not simply be a function of physical properties intrinsic to that state. We could put this point differently by saying that since topologically identical brain states can have different representational properties, representational properties of brain states are not context-independent. The *ET* theory's presupposition that they *are* context-independent is, as we have seen, as uncon-

vincing as the view that representational properties of pictures are context-independent.

We are now in a position to appreciate why the *ET* theory will be unable to specify the physiological regularities corresponding to the semantic regularities between thoughts of agent and percipient. To see why, consider first a formidable and seemingly insurmountable difficulty with a certain view in the philosophy of language. A familiar problem in the philosophy of language is to explain how phonemically or syntactically identical strings of marks or sounds can mean different things, and how phonemically or syntactically distinct strings can mean the same thing. A familiar way of solving this problem is to say that the two strings have the same (or different) meaning when the brain states which cause them are the same (or different). Thus, we are often told, when *A* and *B* both say 'the bill is large', whether they are talking about money or fowl depends on what they are thinking when they utter the sentence, and what they are thinking gets explained (ideally at least) in physiological terms—i.e., in terms of the states of their brains.

But at this point we must ask: When are the brain states of *A* and *B* the same? What, for example, determines whether they are both in the brain state corresponding to the 'fowl' interpretation of 'bill'? We have already noted that instances of one and the same brain state in *A* may correlate at different times with different thoughts, so that the brain state itself does not determine what it represents in any particular case. So whether *A* and *B* are both in the 'fowl' state cannot simply be a function of some properties intrinsic to those states. But to complicate matters further, it is generally conceded, even by physicalists, that *A* and *B* can have brains with different topological properties (or 'wiring' or 'circuitry'),[6] so that there need not be any correlation between the topological (or 'hardware') descriptions of the brain states of *A* and *B* and descriptions of their mental states. It is possible, in other words, that *A* and *B* are both in the mental state corresponding to the 'fowl' interpretation of 'bill' even though their brain states differ topologically—even though, that is, neurological or biochemical descriptions of their brains would differ. What, then, determines whether the brain states of *A* and *B* correlate with the same interpretation of 'bill'?

It is tempting to reply here that similarity between the brain states of *A* and *B* may be explained in terms of their

structural isomorphism. But we can see that this won't help. For one thing, no matter what topological similarities obtain between the brain states of *A* and *B*, there is no reason to suppose that a certain common brain structure in *A* and *B* uniquely determines a certain set of representational properties, just as there is no reason to suppose that a certain brain state in *A* alone uniquely determines a set of representational properties for that state. A common brain structure in *A* and *B* may represent different things in different contexts. Suppose that *A* and *B* each have only one brain state corresponding to a certain mental image of an old rabbi. Presumably whatever physiological properties are common to those brain states in one context are common to the two brain states no matter what context they occur in. But of course those images and hence the corresponding brain states needn't represent the same thing in all contexts. So whether a certain physiological structure common to the brain states of *A* and *B* correlates with the 'money' or 'fowl' interpretation of 'bill' is not exclusively a function of properties intrinsic to that common structure, but is at least in part a function of a set of background conditions.

Moreover, how is isomorphism between the brain states of *A* and *B* even to be explained, if any two person's brains can have different topologies? To say that two brain states are isomorphic is just to say that there is a way of mapping one of the brain states onto the other. But given the appropriate mapping function, or rule of projection, any structure can be mapped onto any other. This does not mean that no two structures are ever isomorphic. But isomorphism between structures is always relativized to some rule of projection, and these rules are not intrinsic properties of the universe. Just as no property intrinsic to a brain state determines what that brain state represents in a given case, no intrinsic property of a brain state determines which topologically different states it is isomorphic with. Similarly, in geometry no property intrinsic to a given triangle determines which other geometrical figures that triangle is congruent with. Depending on what rule of projection we choose, a given triangle may be congruent only with triangles with the same horizontal orientation and the same angles, or it may be considered congruent with *any* triangle, or even with squares or lines.

Of course partisans of this approach to meaning want to say that there is some special way, and not just any old way, of

mapping *A*'s brain state onto *B*'s. But all this means is that we must change our question—and it is only a superficial change—from 'What determines whether *A* and *B* are in the same brain state?' to 'What determines which function maps *A*'s brain state onto *B*'s?', or (since we are looking for some special mapping function) 'In virtue of what is one mapping function to be preferred over all the other possible mapping functions?'. But no matter how we ask the question, it begins to look as though isomorphism between brain states, like representational properties of brain states, cannot be separated from the ways in which those brain states are linked to other brain states and to intersubjective contextual states of affairs like bits of overt behavior.

To see why, suppose that there are no relevant physiological differences between the brains of *A* and *B* at the appropriate time. Now we have already seen that topologically identical brain states can have different representational properties, and that the corresponding semantic properties of the *thoughts* of *A* and *B* at those times are thus not simply functions of the topology of those states. But then the special way of mapping *A*'s brain state onto *B*'s also cannot simply be a function of the topology of those brain states, since this special way is supposed to correlate with what is common to the *thoughts* of *A* and *B*. Thus even if the brain states of *A* and *B* are topologically *identical*, this would not guarantee that *A* and *B* are having the same thought, any more than two instances of the same brain state in *A* in different contexts guarantees that *A* has the same thought in those contexts. The reason is the same in both cases—namely, that what a person is thinking at a certain time, and hence what his corresponding brain state at that time represents, depends not just on the state of his brain but also on a complex set of relations between that person and the world. In fact it is possible that *A* and *B* are in topologically identical states, yet give different answers to 'Are you talking about money or birds?'. So it begins to look as though the only reason we could ever have for saying that the brain states of *A* and *B* are similar in some special way is that they are, in some sense having to do with the ways *A* and *B* relate to the world, *functionally*, rather than structurally, identical or similar.

A sophisticated physicalist might argue here that the necessary and sufficient physical conditions for a person to have a certain kind of thought are still in principle specifiable, but that these conditions must include the complicated back-

ground conditions, or relations between the person and the world, that I have been alluding to. The physical mechanisms, then, for having a certain kind of thought will be spelled out in terms of the structure of brain states as well as the structure of certain other physical states of affairs at the macroscopic level.

But this kind of extended mechanistic approach to meaning actually leads down an endless spiral. Suppose we *do* consider how the brain states of *A* and *B* relate to their behavior (either actual or potential), and suppose that in answer to the question 'Are you talking about money or birds?' both *A* and *B* say (or would say) 'money'. What, we must now ask, determines whether *A* and *B* mean the same by 'money'? Presumably according to the physicalist this question must be answered just as we answered the earlier question 'What determines whether *A* and *B* are talking about money or fowl?'—namely, by reference to the state of their brains. After all, *A* and *B* might not both be talking about money when they say 'money'. *B*, for example, might have intended to say 'bird' but then made a verbal slip, or perhaps *B* really thinks 'money' means what we ordinarily think 'bird' means, or perhaps *B* is lying.

But look at what has now happened. We originally were interested in determining when two bits of outer behavior—two utterances—were semantically the same. We explained this sameness or difference with respect to associated inner states. But then we had to determine whether two distinct inner states were of a certain kind, and we could do this only by reference to further actual or potential bits of outer behavior. And then when asked how to classify these new bits of outer behavior, we once again had to make reference to inner states. And of course the disambiguation of these inner states will likewise demand reference to more bits of outer behavior. And on it goes; the regress, it seems, is fatal. The disambiguation of external states cannot be accomplished by tracing those states back to internal states, since these internal states do not uniquely determine their own application and thus will likewise require disambiguation, and this can be done only by reference to external states, which themselves are not unambiguous.

We are now in a position to see that proponents of the *ET* theory are in a predicament analogous to that faced by proponents of the physicalistic approach to meaning just discussed.

Rather than beginning by considering when two distinct strings of marks or sounds mean the same, we begin here by asking: When are two distinct thoughts both thoughts of the same kind (e.g., when are two qualitatively distinct thoughts both thoughts of old rabbis)? If our partisans of the *ET* theory are identity-theorists, their answer will be: When the brain states which *are* the thoughts are the same. And if they are epiphenomenalists, their answer will be: When the two thoughts are *caused* by the same brain state. In either case, identity of thoughts is ultimately explained by reference to identity of brain states.

Suddenly the terrain looks familiar. We must here ask: When are two people in the same brain state? Since 'hardware' or topological descriptions of the brains of *A* and *B* need not be the same, and since even topologically identical brain states may, in different contexts, have different representational properties, we must as before explain brain state similarity or identity in terms of the causal role or functional properties of those states, rather than in terms of their intrinsic structural properties. But now we can see that even if we can avoid a regress like that discussed above, this concession is fatal to the *ET* theory. If the relevant semantic properties of thoughts cannot be explained solely in terms of internal structural properties of brain states, and must instead be explained, at least in part, in terms of the sequence of behavior or other background conditions in which those brain states are embedded, then there is no way for the *ET* theory to specify the required physiological regularities which would correlate with the recognizable semantic regularities between thoughts. The very specification of the physiological regularities presupposes that there is some way to identify physiological correlates of semantic properties of thoughts, based solely on properties intrinsic to a certain kind of physiological state.

And as if this were not enough, it seems that a version of the aforementioned regress plagues the *ET* theory after all. Having conceded that identity of brain states must be explained in terms of functional properties of those states, then since these functional properties cannot be identified independently of the behavior which the brain states produce, we must at some point ask: What determines whether two brain states have produced the same bits of behavior? Just as two functionally identical brain states may differ topologically, and just as two thoughts of the same kind may differ

qualitatively, two bits of behavior may differ structurally or topologically even though they are of the same kind (and, for that matter, two bits of behavior may have the same structure even though they are of different kinds). We have already considered how this point applies to linguistic behavior. But it applies equally to non-linguistic behavior. For example, *A* and *B* might both be exhibiting the behavior of trying to catch a bus.[7] But *A* might be standing at the bus stop smoking a cigar while *B* is running frantically toward the bus stop. Moreover, on some other occasion *A* might be standing at the bus stop smoking a cigar, but not because he is trying to catch a bus. On this occasion it might be because he is admiring a new sports car across the street. Now the *ET* theory (or one like it) would presumably disambiguate these bits of behavior by rooting them in the appropriate brain states. When *A* and *B* are both trying to catch the bus, the differences in their behavior are simply different causal manifestations of a brain state associated with bus-catching activities. And the underlying differences between two superficially similar bits of bus-stop standing by *A* will be explained as similar causal manifestations of different sorts of brain events. But this move obviously brings us back to the endless spiral, for we must now ask again: When are two brain states the same or different?

IV

We have seen that neither semantic properties of thoughts nor the corresponding representational properties of brain states are specifiable independently of a set of background conditions and are thus not identifiable with mere states of persons. It is for this reason that the semantic regularities between thoughts of agent and percipient in cases of telepathy are not reducible to any mechanistic process between the two persons. Now in ordinary human communication much of the relevant background information is supplied by means of familiar forms of interaction involving the five senses. A person's remarks, for example, are typically disambiguated within a certain conversational context by the way the remarks are integrated with the ongoing behavior of the persons involved. In cases of telepathic interaction, however, these familiar keys to disambiguation are absent. Telepathic 'impressions' (let us call them) are typically not integrated with any

slice of life open to inspection by the five senses. How, then, do the semantic properties of the agent's thought get reproduced in the percipient's thought?

This, I think, is the principal mystery to be solved about telepathy. Even if scientists were to discover that human brains could interact by means of some form of energy transfer—say, ELF waves—we still could not reduce the semantic regularities between thoughts of agent and percipient to any such process, and these regularities would remain mysterious. We must still find the telepathic analogue to the background conditions which make ordinary human communication possible. What this analogue might be, and whether we must search for it in exotic metaphysical realms, are matters that must be postponed to another time.[8]

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NOTES

[1]The reader may notice that this point is similar to one of Broad's *basic limiting principles* in [3]: 3.

[2]See, for example, C. E. M. Hansel, *ESP: A Scientific Evaluation* (New York: Charles Scribners' Sons, 1966).

[3]See Rhine, 'A New Case of Experimenter Unreliability', *J. of Parapsychology* 36(1974): 215-25.

[4]See, for example, the exchange in *Nature* 245(Sept. 7, 1973): 52-4, as well as R. Thouless, "Some Comments on 'Fresh Light on the Shackleton experiments,'" *Proc. Society for Psychical Research* 56(1974): 88-92. There are also rumors circulating through the parapsychological grapevine of new, very damaging, and soon to be published evidence against Soal.

[5]This is often called the 'brain-radio' or 'radiation' theory. But these terms are usually understood to suggest that telepathy is mediated by some encoding/decoding process. I choose, then, what seems to me to be a more neutral, and certainly less abused, term.

[6]This is by now a familiar point. Jerry Fodor puts it this way (in *Psychological Explanation* (New York: Random House, 1968)). '. . . there is no *a priori* basis for supposing that a parsing of the nervous system according to the psychological function that its parts perform would correspond in any simple way to parsings that are effected in terms of its gross topographical, morphological, or biochemical divisions. . . .The notion of a functional parsing of the nervous system demands the definition of some notion of functional equivalence for sets of neurological states *that may in principle be arbitrarily different in their physical characteristics*' (my italics) (p. 145).

[7]This example is inspired by a similar example in Norman Malcolm's *Memory and Mind* (Ithaca: Cornell Univ. Press, 1977).

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