Perception and Deception

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Although science in its public relations often describes itself as a truth seeker, it cannot be said that it has pursued this enterprise with equal fervor on all occasions. There are some hypotheses about the natural world which, if they turned out to be true, would ruin or at least seriously tear the fine fabric of science's theoretical structure. One might expect the scientific community to examine these hypotheses with extra care, and sometimes with a mood of unshakable disbelief. And yet these very hypotheses that threaten science's mode of work are ones that many men want to be true. They are what C. G. Jung would call "archetypal," because they speak about very fundamental aspects of the human psyche.

Freedom of the will is a well-known example. The human wish is that each man be free to make his choices. But if, as Democritus argued, the world is basically made up only of material atoms, then where is freedom to be found? Lucretius, speaking for Epicurus, suggests an answer: some straight-falling mass particles "at uncertain times in uncertain places" (*1*) deviate from the path by what might be called a "*momen mutatum*." It is surely a very little emendation of Democritus' theory that Epicurus made, just an "epsilon" of a deviation, but it is entirely too much. For if one permits some atoms this privilege, then all physical laws must be modified in an absurd manner; the differential equations of mechanics must add the proviso "so long as no deviant atoms are about." The Epicurean hypothesis as it is stated is intolerable. In the 19th century when vitalism tried to revive it in terms of the spontaneity of life, science's reaction was to be expected. The various pieces of experimental evidence of spontaneity were carefully scrutinized and found unacceptable (*2*).

The several hypotheses about extrasensory perception have much the same character as the free-will hypothesis. Men want to believe that some people at some times are endowed with a power to perceive what others cannot: for example, another's thoughts, a future event, a spirit's communication. These hypotheses are as modest as Lucretius' *momen mutatum*: only a few people have extrasensory perception and only sometimes. Yet the hypotheses are just as intolerable, and for the same reasons. Each time that one of Lucretius' atoms deviates at "uncertain times and uncertain places," the Lucretian theory simply gives up a modicum of experimental control, a modicum that eventually becomes monstrous. Similarly, if some people at uncertain times and places can perceive "outside the senses," then those who perceive "within the senses" do not perceive the entire story, nor can they ever hope to do so. If ESP is a correct hypothesis there must be a fundamental lack of control in all empirical inquiry. Yet men want to believe in the truth of ESP.

Tactics for Termite Hypotheses

Science has attempted to cope with "termite hypotheses" like free will and ESP in several different ways, all of them depending on the interpretation of the hypothesis. First, the hypothesis may be so interpreted that its truth or falsity is totally independent of either the method or the findings of empirical science. This is the philosophical solution suggested by both Hume and Kant for the most significant hypotheses of all, the existence of God and the immortality of the soul. The "solution" permits the empirical scientist to declare that the existence or nonexistence of God is a matter of personal belief and that the truths of science remain unaffected no matter how this personal belief is expressed. In more recent times, logical positivism has relegated these and like hypotheses to the class of "meaningless" assertions by claiming that they are devoid of empirical content. It is true that Kant, with far deeper insight than positivism, had gone on to say in his second *Critique* that any enterprise seeking an ultimate value—the good or the true, for instance—must postulate a guarantor (God and immortality), but 19th- and 20th-century philosophy of science has simply ignored this rather obvious lesson and continues to maintain the epistemological separability of questions like the existence of God and the immortality of the soul from the questions of empirical science.

It seems unlikely that the hypothesis of ESP can be handled by this first tactic. If some people at some time can "perceive" by "extrasensory" means, then there must be forces or linkages at work that are as yet unknown, but which, if they really do exist, would seriously modify the results *and* the methods of science. The kind of data which ESP deals with cannot *in principle* be separated from the rest of the data which empirical science handles. One can never tell when ESP-like data will show up and without our knowledge "infect" ordinary data.

The second tactic of science is to interpret the hypothesis so that its threat is entirely removed. This lets the hypothesis take its place among other empirical and interesting hypotheses in the body of science. This is the approach used to resolve the problem of free will, first by E. A. Singer (*3*) and later by Rosenbleuth and Wiener (*4*). These authors showed how the categories of purposive behavior (choice, means, end, and so on) are logically consistent with the categories of statistical mechanics, and how in some instances these teleological categories may provide a far richer and more basic description of aspects of the natural world. It is of historical interest to note that decision theory, operations research, management science, and system science, which have flourished in the last two decades, are all based on the concept of "optimal choice," and all use teleological categories without ever having to defend their right to do so. The scientific interpretation of "purpose" and "choice" probably do not satisfy the basic psychological wish of man to be a free agent, but modern teleology has certainly cleared the air enough so that the classical issue of freedom versus determinism can be redefined in a significant manner.

In the case of ESP, the second tactic seems quite attractive. For example,

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one might simply say that ESP means "unconscious perception." Thus some men at some times are able consciously to perceive what other men perceive only unconsciously. This interpretation of the hypothesis is certainly not threatening; it is in fact rather obvious because it describes the everyday life of the observing scientist. The very perceptive men of science are those who become aware of things that their colleagues are unaware of. As soon as the very perceptive mind points out these things, the whole matter becomes, as Watson so often says to Holmes, "quite obvious." The implication is that the less perceptive person really "saw" the same things as the perceptive one, but was not aware that he saw them. If consciousness means mental response to a sensory input, then it is easy to construct a model of the mind in which sensory input can occur without consciousness.

As C. E. M. Hansel points out over and over in **ESP: A Scientific Evaluation** (Scribner, New York, 1966. 285 pp., illus. $6.95), there can be little question that unconscious sensory perception has occurred in many ESP studies: the subjects are not necessarily aware of the "clues" they may receive from the spoken words of the experimenter, or the markings on the cards, or the physical set-up of the environment.

But neither parapsychologist nor layman would settle for such a bland interpretation of the ESP hypothesis. "Telepathy" means awareness of another's thoughts *without* communication via sensory channels. There is also precognition, which is knowledge of future events via a "direct" non-sensory channel. Of course it is not clear to anyone what the "extra" in extrasensory perception really means. Judging from the experiments described by Hansel, it means some channel of communication "other than" those recognized by today's psychologists. The experiments are attempts to "shut off" all known sensory channels. In the case of telepathy and clairvoyance, one could certainly maintain that there are some unknown sensory channels that most of us are unaware of, but this avenue of approach seems not to have been explored. Indeed, judging from Hansel's book, there is a deplorable lack of thinking on the part of the parapsychologist, so that "extra," as Edwin G. Boring says in the introduction to the book, is a conceptually fuzzy negative property. For this reason, it remains quite obscure whether the second tactic—that is, an interpretation of ESP in unobjectionable terms—is a satisfactory approach.

Finally, science may adopt a third tactic, by interpreting the hypothesis literally and attempting in all honesty to examine the evidence for its validity. This was in some sense the tactic of the mechanists in the mechanist-vitalist dispute. It was also the method used by Ernest Nagel in examining the hypotheses of psychoanalysis (*5*). It is the tactic that Hansel uses to the full in his book. It is a deadly serious tactic, and this is its chief flaw. The examiner, or inquisitor, assumes the role of a judge who accepts a certain set of "facts," in Hansel's case a long list of responses of subjects in various experiments. The judge's task is to determine whether the proffered hypothesis (ESP for example) is the sole "likely" explanation of the facts. If not, then the judgment must be, in Nagel's terms, "not proven." The judge, in effect, creates another "suspect" and tries to determine whether this suspect might just as well be the guilty party.

The Trickster

Hansel's suspect is what the American Indians called the trickster (*6*). Sometimes the trickster inhabits the bodies of the subjects, who play all sorts of tricks on the innocent experimenters. Sometimes he is in the experimenter himself, playing tricks on other experimenters. Now the judge is a serious man, and for him the trickster is not the least bit funny, but for anyone watching the trial the entire scene at times seems hilarious, or just plain frivolous. Consider the scene in which distinguished academic professors like Henry Sidgwick and William James sit around seriously watching the antics of clever biddies and brattish youngsters going through their tricks. In the end, though, humor is banished and the serious judge has the final say: trickery, says Hansel, is as likely an explanation of the "facts" as is ESP.

I have said that this tactic of science in coping with dangerous hypotheses has the flaw of being too serious; it takes science itself too seriously. Hansel wants to let us know that the parapsychology experiments were "sloppy." If these judges are fair as well as serious they must also show that all other experimentation resulting in hypotheses that *are* accepted by psychologists are *not* sloppy. Perhaps this is too much to ask, however. More to the point would be to show that we know enough about the trickster to know that in the main he plays no role whatsoever in "normal" scientific experiments. Now it is interesting to observe that no other set of hypotheses of psychology has received the degree of critical scrutiny that has been given to the ESP experiments. Nor am I aware that anyone has really put his mind to the study of deception in empirical science. Much of the time we accept the ridiculous assumption that if the investigator knows in his own heart that he is honest and objective, self-deception cannot occur. And yet over and over again in experimental science one can detect hidden deceptions. I well remember the shock I had as a young statistician when I began checking physical measurements to see if they were in "statistical control" and found that they were far from it; for example, that there were significant differences between runs in the measurement of the velocity of light, the same indented steel bar received Rockwell hardness readings ranging from steel as soft as lead to the hardest possible, and so on. It almost seemed as though a suspicious person—and all statisticians are suspicious—could be sure of finding a hidden flaw in any set of data.

Consider, for example, Hansel's two criteria for accepting ESP: "(i) the scores achieved by the subject must be such that they are very unlikely to arise by chance, and (ii) the experimental conditions must be such that only ESP could account for them." In order that the second criterion apply, all "likely" candidates must be eliminated. How can this be done for any hypothesis? One is reminded of Mill's famous Method of Difference: if when X occurs along with Y, Z also occurs, but when non-X occurs along with Y, Z does not occur, then X and Z are causally linked. The lesson every logic student learns is that there is no practical way whatsoever to guarantee that "Y" remains the same in two experiments, since so much about the natural world is constantly changing. Mill's canon, and Hansel's criticism, make sense only in the context of a model. One cannot *observe* whether all things remain the same; one can only *reason* that all relevant things are the same. Hansel's model includes the deceiver, but unfortunately tells us entirely too little about him. If you could say, as some experts seemed to say in a recent NBC telecast on

ESP, "on this side we are not deceived because we observe so clearly and our logic works," then deception has a very specific meaning. It means the other side, where the trickster is simply the man who *intends* to deceive. Such an intentional trickster may well have played his role in every ESP experiment. But if we say that there is a more universal trickster at work, and that unconscious deception is always a likely occurrence in all attempts to discover truth, then who can guarantee the absence of deception in any experiment?

Hansel seems to feel that the sloppiness of the ESP experiments could be removed if the experimenters used mechanical devices in shuffling cards, transmitting messages, and so forth. He may be right, for every experiment that was ever run is subject to improvement; but it is doubtful if mechanization is the sole answer, as everyone knows who has tried to work with computers in a man-machine symbiosis. It is amazing how easily deception occurs on such occasions.

But even if "clearcut" experiments could be devised by more controllable mechanisms, we would learn very little from them about deception or ESP. A parapsychologist could assert that the very existence of the mechanisms "cuts off" ESP. I think it would be much more to the point to test ESP against a very astute and self-conscious trickster—for example, a professional magician. Could such a person achieve scores that are "highly significant" without the experimenter's being able to tell how he did it? If the method was revealed (at the price of retirement for the magician) wouldn't we then learn something about the role deception plays in ordinary as opposed to extra-ordinary science?

At the risk of overworking the etymology of two terms with the same very common Latin root, I note that perception and deception are two modes of "capturing" nature, "through" and "away." It is sound to say, in the mood of Hegel, that there is no perception without deception. For Descartes, deception was an evil, created by a perfectly malevolent being. To assure himself that deception cannot occur in the simplest and clearest of the facts we humans accept, he argued that we must first prove that the perfect trickster cannot operate in this domain because there exists a benevolent god who prevents him from doing so. We have found Descartes' solution unacceptable. Instead, we could say that the most there is to be learned from an experiment is to be found in the ways in which the experimenter was deceived. If so, the "purpose" of science is to create a satisfactory theory of deception. It is doubtful if modern science has accomplished all there is to accomplish in this direction.

But what of ESP? Is it "true"? It is surely true as a human feeling, and no amount of criticism of Hansel's type will have much effect on this feeling. As can be seen, I'm in favor of choosing the second tactic mentioned above: to interpret ESP in a "satisfactory" manner, for example, to call it nonintentional deception in perception. Of course I realize that this definition has the advantage and the disadvantage of being unacceptable to the parapsychologist, who wants to keep the mystery and the reality at the same time. He wants to say that there "really" is a mysterious linkage between some minds and some events. But I am saying that what we humans take to be "really" the case always has elements of deception in it. Thus I can't help asking whether the "wonder" about ESP is no more than a manifestation of an unreflective and pure acceptance of the findings of modern science.

References

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5. E. Nagel, "Psychoanalysis: Scientific method and philosophy," in *Methodological Issues in Psychoanalytic Theory*, S. Hook, Ed. (New York University Press, New York, 1959).
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Biology and Taxonomy of the Protozoa

Protozoology (Thomas, Springfield, Ill., 1966. 1188 pp., illus. $15.95) by Richard R. Kudo is now in its fifth edition. This fact alone attests to the book's lasting value as a text and reference. As in previous editions, the bulk of the reference value lies in the second of its two parts, Taxonomy and Special Biology. This section has now been expanded to include newer genera and species, and the nomenclature has been revised to include the new system of uniform endings for names of higher taxa. For the biologist who is not a protozoon taxonomist, Part 2 is possibly the best and cheapest source (in English) for brief descriptions and relationships of Protozoa.

For the more serious student, however, the book will be a starting place rather than a definitive work. (In the preface Kudo describes it as a university text.) Certain errors of omission occur which will seem inexcusable to specialists in the groups involved. For example, the lower Trypanosomatidae are inadequately handled (p. 420), neither the well-justified separation of *Blastocrithidia* from *Crithidia* being recognized nor the status of the literature-infesting name *Strigomonas* being mentioned. In addition, the peculiar and indiscriminate use of the words *Trypanosoma*, Trypanosoma, and Leishmania (capitalized, italicized, and not italicized) for generic names and Trypanosoma, Leptomonas, Leishmania, leptomonas, and leishmania (capitalized and not capitalized) to designate body forms will do little to help students understand this family. (The widespread use of non-italicized generic names, even for hosts of parasitic protozoa, is a regretful legacy from previous editions and is distracting to the reader.) Likewise, many malariologists will deplore references to such things as a "motile ookinete." The handling of such confusing organisms as *Sarcocytis* and *Toxoplasma*, however, is to be commended. Perhaps the author should have justified his placing of these genera in the Haplosporida, but his reluctance to assign them to lower taxa is a true reflection of their present status. The expanded information on *Toxoplasma*, emphasizing its role as a human pathogen, is an important addition.

Perhaps careful scrutiny of every taxonomic group would reveal inadequacies, and even beginning protozoologists may wonder at the arrangement which seems to include the Opalinida in the subclass Peritricha. Any failings, however, should be interpreted in light of the fact that this book is the only current text to present descriptions and a taxonomic scheme of all groups of protozoa, down to genera and representative species.

Part 1, General Biology, is perhaps subject to sterner criticism. This sec-