# ROUND TABLE DISCUSSION

KELLY: I want to address a number of questions to Karl Pribram and I'd like to address them with a mildly lengthy preamble. Yesterday, I characterized my own position on the mind/body problem as being one that will, at the cost of considerable intellectual discomfort, stay as close as possible to the present majority doctrine. Therefore, unlike a number of other people here, who I think are quite prepared to make the leap to dualism, I feel greatly attracted to the *kind* of position Dr. Pribram offers apart from its specific contents, and I would love to be able to embrace it with open arms. At the same time, I must confess I feel considerable difficulty with it, which may well be due in substantial part to simple lack of understanding. I don't claim to have really grasped the theory in any depth, but I will certainly spend some time now looking into it further. I do, however, immediately feel certain kinds of discomfort.

First of all, as Dr. Pribram certainly knows and many of the rest of you probably know, there has been a history in psychology of too eager acceptance of certain kinds of technological metaphors and formal models from outside, some of which really haven't panned out very well. Things like Game Theory and Information Theory, for example, never really lived up to their advance billing in psychology. More specifically, I feel a kind of analogy here to Noam Chomsky's attitude toward Skinner's account of verbal behavior. Just to review that briefly—Chomsky argued that Skinner was attempting to analyze verbal behavior in terms of a certain kind of specific model derived from experimental work in operant conditioning. Chomsky argued that one of two things was taking place, neither of which was very satisfactory. Either on the one hand Skinner was using his experimental model literally, in which case Chomsky could show it failed to account for the relevant phenomena, or he was using it metaphorically, in which case—so what?

Now this, of course, is not a criticism of Dr. Pribram's theory. I'm merely expressing in a more particularized form the kind of general discomfort I feel. These are the questions I would like to see answered.

I certainly don't expect to have that happen in any detail here because there's just too much of it, but my general sort of vague discomfort over the last several hours has somehow mysteriously precipitated a small number of very specific doubts that I would like to address now to Dr. Pribram.

First of all, I wonder whether the theory would be extendable to handle PK-like phenomena. Secondly, I wonder if you could identify some feature of the theory that would seem to be required to account for the fact of great individual differences in ability to acquire paranormal information. It seems that something like the notion of an aperture, access to a greater or lesser portion of the holographic information, is required to account for that. I wonder if you would say something about that and whether it might be identifiable with some aspect of brain mechanism that we could look at.

And thirdly, I'd like to raise the question of the viability of this metaphor as an account of mechanisms of memory. Again, I know very little about holography, but the little I do know, derived from *Scientific American* articles and the like, suggests that it would be particularly apt as a model of storage and retrieval that would mimic, say, the properties of the laws of association. That is, retrieval of things that were physically or temporally contiguous would be rather easy to account for in this sort of model, but I think it's clear that our memory has to be much richer and stronger than that. We certainly can use stored information in a wide variety of contexts that are related in very indirect ways to the context in which they were learned, and I wondered whether the theory would be able to extend and handle things of that sort. Finally, I would just observe that the Bohm-style interpretation of physics (which means virtually nothing to me) though not *sufficient*, appears *necessary* for your interpretation of ESP events to have a chance of success.

PRIBRAM: Let me start with the less differentiated questions first. I don't think Game Theory and Information Theory were as bad for psychology as you may think. Ross Ashby once made the point that although Information Theory won't answer your questions, it allows the questions to be phrased in a much more precise way. I think originally we were very naive in the way we used Information Theory in our experiments. In one of mine, stimulus Sampling Theory turned out to be more useful than Information Theory. On the other hand, I've had some very good luck with Game Theory in a specific experiment. So I believe these theoretical approaches have not been as fruitless as all that. It's just that our expectations were too high. Just as in

the brain hemisphere approach. I'm quite sure the hemispheres are very different in many of the respects that have been talked about here, but when one goes overboard and tries to prove that hemispheric differences explain everything, then the difficulties arise.

The same applies to holographic theory. When I started out, the holographic theory for me, was a metaphor. I turned that into an analogy very quickly by suggesting an experimental data base for it, and then over the years additional data have gradually made a precise model of it. The model deals with a network of graded potentials that I call a micro-structure in the brain. I'm now talking in mathematical specifics, which can be tested at the neural level, and no longer in terms of metaphor.

Now, as for your three specific questions. The first two I'm not going to be able to do very much with. PK phenomena I have thought about only in the context of this conference. As I've said, the closest thing that I've come to is that the motor cortex encodes a representation of the environment, and we, of course, act on the environment to make it a representation of us. The reason I can ride a bicycle is that it encodes something I can do, so there is some kind of reciprocity between motor cortical function and environmental function. Some of the things that were said at this conference, therefore, don't sound too wild if we once accept the fact that the skin is only an arbitrary boundary. Further, I think that the holographic hypothesis gets us into a ball park where one can conceive of the things that are being said here, but I have no specific mechanism to handle PK *per se*.

As I noted earlier—the holographic hypothesis or model is limited in its application. In many ways it's like the random access memory of a computer. The memory storage system of the computer doesn't help very much unless there are programs to address it. The only difference between a holographic brain store and a computer store is that the brain store is content addressable instead of location addressable. In a sense, the holographic store is what Chomsky calls "deep structure." Now we're dealing with a central memory process that has to be accessed by some kind of a program. Access is much more of parallel process than it is in our serial computers. Equations that produce holograms are called spread functions because information becomes distributed. The distributed, dismembered store has to be remembered. There is much more to brain function than just its holographic aspect.

For instance, you mentioned an aperture-kind of mechanism. This is intriguing. The limbic system and the basal ganglia might well control the band-width within which we process information. If we're operating in the frequency (holographic) domain, band-width would accomplish what you envision.

KELLY: The essential thing then is that the form of storage and the processing mechanisms that operate on that storage, you see as being separated, so that the capacities of the retrieval system would not be restricted to these relatively elementary properties of holograms.

PRIBRAM: Holograms don't have to be optical.

TART: I'd like to bring up for discussion a phenomenon which is either very difficult to reconcile in terms of brain functioning or which may fit very readily into Dr. Pribram's holographic model. I'm not sure which, but I'd like to get some comment on it. This is one aspect of what's frequently reported in "near death" experiences—the review of one's life; the feeling that all of one's life is remembered. For some people, judging from their reports, this is a metaphorical kind of statement about some important scenes flashing before them, but some of these people insist that in this near death experience, *all* of life is literally re-experienced.

One obvious way to deal with this is to say the experiencers are hallucinating, their brain is in a terrible shape and you don't have to believe a word of it, but I'd rather not throw out the experience. Now, if the experience is happening pretty much as described, it clearly is not happening in ordinary brain process time. Synapses cannot fire that fast, by many orders of magnitude. Moody gives a rather excellent example of someone "inducing" the near-death experience (if we can speak that way) by falling off a building and going "splatt" in a parking lot. He reported finding himself in the air, seeing people starting to run toward his body, then going into this near-death experience, re-experiencing his whole life, finding himself once again looking down on his body and observing that people have gotten only a couple of feet closer in the time during which he's reviewed his whole life!

Now, this is obviously incredibly fast—many orders of magnitude faster than ordinary processes. Does anyone have any light to throw on this?

PRIBRAM: Synapses don't fire, by the way. They operate only by way of graded potentials—the microstructure I was talking about—local circuit neurons don't fire at all—their potentials wax and wane.

With regard to your question: when a memory store is addressed simultaneously by a parallel process almost instantaneous correlations and other computations are achieved.

BELOFF: My reaction, very often, when I encounter some brand new theory of mind such as yours, is to ask myself, not so much, what does it explain, as what does it exclude? Searching around for one thing that it might perhaps exclude and which could therefore serve as a test of the

theory, it occurs to me that survival in any form would come into this category. Once the brain is wiped out, the holograph is wiped out, and there can be no existing entity of any kind to survive. I wonder, therefore, whether, in the true spirit of science, you are a keen promoter of survival research, if only to see whether anything could come of it?

PRIBRAM: First of all, I do *not* have a general explanation for everything. *Let's get that very, very straight*! You're misinterpreting! I just got through saying that the holographic theory doesn't explain brain function without recourse to a computer analogy: programming is necessary for retrieval. With the holographic hypothesis I have provided a previously missing link, and *that is all*. Now, as far as survival is concerned, yes, the holographic theory does have something to do with this. I have said that in the frequency domain there is no time and space. To survive means something only in time. What then can be meant by survival? It is an inappropriate question for this domain.

BELOFF: I'm afraid I'm completely at sea here. I mean, one day you're going to die. Whether it's in time or in space or not, one day you're going to die. Now, can you conceive, the day after your funeral, of having any kind of experiences, trying to contact people, etc.?

PRIBRAM: I wish I were just at sea. I'm in a hologram. It's worse! It's so difficult for us to imagine what this kind of universe, this level of reality, is all about. There are no objects in it, there are only monads. We exist in terms of the whole. There isn't anything like "my dying," because there's no such thing as "me" in this domain. You have to get back to our ordinary domain to talk about me and dying. I've never understood what mystics were talking about until now. Now I realize they're talking about "nothing," but nothing is "no thing" not necessarily emptiness. It's an entirely different domain. It requires a metamorphosis in our thinking. The questions you're asking are about the ordinary domain, and they're very good questions, and I'd like to know the answers, but I don't know them. But in the holographic domain, these questions just don't make sense.

BUDZYNSKI: One thing in Dimond and Beaumont that I recall, reflecting on your comment, Charlie, was about the business of the near death experience and everything being read out all at once, as it were. They found that the right hemisphere apparently processes material in parallel much better than does the left, which likes to have things come in sequentially.

In another experiment they mention in that book, it was found that, if they give the left hemisphere and the right hemisphere vigilance tasks to perform separately, by flashing things in the left visual field or the right visual field, eventually the left hemisphere begins to fatigue. It begins to increase in errors. On the other hand, the right hemisphere does not seem to increase in its errors. It starts at a higher error rate and then continues through at the same rate. They ran the subjects for about eighty minutes, and they did not show a decrease in right hemisphere ability. What they concluded was that the right hemisphere acts as a backup computer in vigilance, so as the left drops off, the right is still there tracking along although at a lower vigilance level. Now, if a person is close to death, arousal level is decreasing in the cortex, and possibly the left hemisphere could lose its functioning ability at a faster rate than the right. The right is now released of its inhibition by the left. Perhaps there is some ability at that point to read out, in very fast time, the storage of a lot of visual imagery memories, since it does things parallel as opposed to sequentially.

EHRENWALD: What I have to say about out-of-the-body experiences, takes us very much up into the air. I think the problem has three aspects. The first aspect is the physiological correlate of the experience. That has been discussed before. I brought it up yesterday and tried to talk about it in purely clinical and neuro-pathological terms. Another aspect is the speeding up of the experiences during the moments preceding death. They, too, as Dr. Pribram explained, can very well be interpreted in neurophysiological terms. But there is a third aspect. It is the question of whether there is a veridical element involved in the out-of-the-body experience. Now, I submit that to the extent that there is a veridical experience involved it is much the same as that seen in various altered states of consciousness anywhere. It is in no way different from veridical experiences under trance conditions or under the influence of LSD, or some major traumatic or crisis experiences. But to my mind this has nothing to do with survival. It is true that some people who have gone through such experiences tend to misinterpret or embellish them and use them as evidence of survival. In order to understand such claims, we have to go beyond a purely physiological approach and look at psychodynamic aspects. Viewed in this light, the whole out-of-the-body experience appears as an heroic attempt at denying death. In fact, most cases that have come to my attention are subjects whose first experience along these lines occurred following a surgical operation or some other mental or physical stressful situation. For instance, Robert Monroe had his first out-of-the-body experience

in the wake of an anxiety attack. He went into a panic when he had the fantasy that a "whiskered man" was lying next to him in bed. In the end he realized that it was in fact his alter ego or double.

Experiences of this order make people feel that they had a brush with death. But what actually happens is that they come back from a harrowing traumatic experience and may be elated to find themselves restored to life again. Some of you may have had similar feelings of elation following a migraine attack.

DIXON: I would like to take up the point you raised, regarding what appears to be a whole memory for past events in life that occurs in a crisis. I'm reminded of a recent paper by Weiskrantz on people who were suffering from organic memory disorders. I think an interesting point is not that these people can't retrieve, but that they suffer an intrusion of a whole lot of irrelevant material. He likens this to the same sort of thing that occurs in some cases of schizophrenia. But this raises another point—namely, the apparent exaltation of consciousness in the minds of many of us. It always seems to me (following the thinking of Spence and his colleagues in New York) that in fact in some ways consciousness is rather inefficient as reflected, for example, in what Spence has called the restricting effects of awareness. Now one consequence of this is the change in time sense with altered states of consciousness. Take, for example, the nitrous oxide experience which is rather like your "memory before death." You go to the dentist and are under for a few seconds while they remove teeth, yet during these few seconds you have a long dream which is full of material and almost your whole life passes before your eyes. I'd be interested to hear your comments on this.

TART: I'd like to make a brief reply to that. Time, as we ordinarily think of it, is a psychological *construction* which we have reified into an absolute concept that we think has to do with the world. But it's clear from the variations of experience that can occur in altered states that there's a lot of ways time can be constructed, and I'm very suspicious of ordinary physical time as the measure of any kind of absolute time. I've further been driven to that position by looking at the data on precognition and realizing that there are times when the mind can do what is para-temporal in terms of our ordinary conceptual systems. It makes no sense and yet it does happen.

As far as consciousness being a burden is concerned, I don't know. I've gotten more pessimistic lately, and I think consciousness is largely a trivial reflection of conditioned processes in a lot of cases. But I still have faith that consciousness can be an extremely important mediating

variable when used as more than simply a trivial reflection of relatively automatic processes. Consciousness, in a sense, is almost a luxury. It's a rather passive mechanism for things that can be understood in a very behavioristic, neurophysiological kind of way ordinarily. But I see a more important role for it, one that gets back to seeing the more primary effects of the M/L system rather than strictly its emergence into consciousness. I don't really have time to go into this here.

UNIDENTIFIED VOICE: To put it very simply and crudely—and you're getting nearer to what I feel about it—I feel if there is some evolutionary purpose in consciousness, it is purely to provide us with a highly spurious and often deceiving form of positive reinforcement. There are conscious experiences that are pleasurable—humor is a very good example—and it makes us repeat that particular action, but so many complex, high level skills are not just ones that run off automatically, parts of your M/L system, but real creativity occurs in moments of unconsciousness. I mean, I'm sure you, in your work, must have experienced these, and I am sure Karl has had the same thing. His whole hologram theory might well have occurred during periods of total unconsciousness or in deep sleep, and this, you know, is a well-documented phenomenon.

TART: Well, to return that to a right-brain approach, if I offered you a drug right now that would obliterate your consciousness for the rest of your life but allow you to continue functioning, would you take it?

PRIBRAM: A clarification question here. Do you mean by "consciousness," "self-consciousness," or simply being able to respond? In other words, when I'm driving a car and stopping at lights, and talking to somebody about parapsychology, would you say driving the car is a conscious process? It could well be that when you're driving a car and talking to somebody next to you, it's your unconscious—not necessarily in the Freudian sense—which is doing all the work and all the thinking and being extremely creative. I believe there are descriptions of people who are just about to have a serious motor accident doing the right thing automatically. Afterwards they're amazed they were able to do it, and if they'd been self-conscious at the time, they'd probably have come unstuck. So what you are referring to is self-reflective consciousness.

TART: I'd make the distinction between simple and self consciousness also. But when I speak of consciousness as an emergent, I'm including both. Consciousness which is not very self-reflective as ordinarily experienced comes as an emergent of the B and M/L system.

Self-consciousness is a further development which may or may not be a handicap. As to your motor car accident cases, we have a biased sample from those who survived.

DIXON: Karl, could you please say more about the analogy you drew between a hologram and a Gestalt isomorphism.

PRIBRAM: What I said specifically was that if there is a hologram in the brain and if isomorphism is true, then we begin to look to see if there is one out there as well.

DIXON: But one of the implications that follows from this, surely, if I understand you rightly, is that there is a holographic correlate in the brain of the external world, which is very like the Gestalt we're talking about here. Now, what seems to me to be paradoxical here is that Lashley himself did experiments to show that this type of distribution within the brain did not occur. I've always assumed that this was a valid experiment. The question I wanted to ask you is, are there equivalent experiments that have been done or would be done to test your theory; are there particular perturbations that we would predict would destroy a hologram? This would seem to be a crucial test of your hypothesis.

HONORTON: I was slightly disturbed, Karl, by your reaction to John Beloff, because I think you set us up yesterday to expect more than you were able to deliver today and if you hadn't done that, we wouldn't have had such high expectations. It seems to me that your paper is more of a tutorial, perhaps, than a "progress report on a scientific understanding of paranormal phenomena." Whenever questions were given to you concerning the application of this to psi phenomena, you have had no comment in terms of how this theory specifically relates to what we here are primarily interested in, which is advancing an understanding of these phenomena in a way that allows for experimental study. At the present time, it seems to me that the kind of responses you're giving us are very similar to what we would get from a guru who is proposing what, I gather, you consider to be in some ways a similar type of proposition, but which at the present time, at least, seems not to have any clearly defined empirical consequences for parapsychology. If I'm wrong, I wish you'd correct me.

PRIBRAM: In reply, I would say you're wrong in the sense that by scientific understanding, I mean, not a statistical base, but a base of understanding of possibilities for a phenomenon to occur. That's what I mean by an understanding. As George Miller once said, "The reason we want a good theory is so that we *don't* have to do any more experiments."

HONORTON: Then how do you go about deciding whether you're going to accept or reject a particular theoretical proposition?

PRIBRAM: There's only one criterion. The same criterion you use when looking at a painting—elegance.

HONORTON: Well, then we should abandon this and call ourselves philosophers.

PRIBRAM: No, I don't agree with that. Elegance in *science* has to have some *practical* outcome. We do have to be able to test in science. George Miller's statement was made merely to point out that testing and data gathering *per se* is not *all* that science is about.

HONORTON: Then it has to have empirical consequences.

PRIBRAM: Of course; I gave you a large number of them with regard to the holographic theory.

HONORTON: Not in our area, though. Not in parapsychology.

PRIBRAM: You don't have an "area."

HONORTON: I beg your pardon?

PRIBRAM: You see, what you're trying to do is to hang on to a conceptual frame that separates an area which in another frame does not exist. I don't think paranormal phenomena are that different from any other phenomena that scientists address. I don't think there is an area called "paranormal." Mystics, humanists and scientists are all in the same boat studying *experiences*. No one is going to obtain scientific understanding of experience, normal or "paranormal," by simply trying to prove that it exists.

HONORTON: I agree, but I don't see that what you are proposing is helping me as a researcher right now. That's my only point.

PRIBRAM: I think that, if you can make that transformation into thinking in the holographic domain, certain questions will be asked in a very different way. It will sharpen the way questions are being asked. It's how you ask the question, as I said about information theory.

HONORTON: O.K. I wanted to ask Tom about the current status of the Miller/DiCara replication problem. Is there an explanation of that? Is it working again? Is it not working? What's the story?

BUDZYNSKI: The last I heard, it was working, but not as well as DiCara had presented it. The answer to your question, "Why doesn't it work as well?" is still a mystery. There are a number of variables that have not

been able to be replicated, such as the exact kind of curare drug that was used. The company that made it went out of business. The early respirators were fairly poor. It's now known that the animals were probably in a state of hyper-arousal or sympathetic drive at the time that they were being respirated. So you were starting from a high arousal point, and in some cases asking the animals to decrease certain autonomic responses which they, of course, would find it easy to do, since, in a sense, they were already at a ceiling point and could easily drop down. They were probably in a state of acute discomfort with their stomachs being dilated in certain instances because the respirators didn't work the way they were supposed to. Barry Dworkin came over from Oxford, I believe, and succeeded in generating a better preparation—that is, a rat that will live for eleven days rather than four hours under repeated curare, but as I understand it (I haven't seen anything in print yet) though they did get some results, they still have never come back to the level of results that were reported by Miller and DiCara originally.

ANGOFF: The end is at hand. We have ranged far in the realms of psi and consciousness, and yet, to paraphrase a famous line, "Oh, that a man might know the end of the business of these two days." This we have not achieved, but surely we have here made important explorations. The accounts of these explorations, I again remind you, have been recorded and will appear in book form. After you have had an opportunity to review your contributions, and with your cooperation, a book will result within eight or ten months, and it will reach the larger audience of your colleagues, of scientists everywhere. The Parapsychology Foundation thanks you for your efforts, for your participation in the meetings of these two days.

Ladies and gentlemen, this concludes the Twenty-Seventh Annual International Conference of the Parapsychology Foundation.