

OPEN DISCUSSION

SERVADIO: Thank you very much, Dr. Grey Walter. Now we have half an hour for open discussion. Are there any questions?

BURKE: On this matter of expectation, maybe I didn't understand you correctly. Would there be two kinds of expectation—expecting one or not? I mean, aren't they both expectations: "I'm expecting a click," or "I'm not expecting to get a click?" Can you clear this up for me?

WALTER: The mental state was really simply guessing rather than expectation. It's like a fruit machine, really. The person was guessing whether he would or would not get a click, and of course, the process of guessing not and not receiving is a real positive experience. In fact, there is a little wave when the person expects nothing and it doesn't happen. This is a good guess too. The "something" may be unpleasant (although in these cases the stimuli were fairly neutral) in which case we would say the person *hopes* it will not happen and then we get a large wave, a negative hope wave, so to speak. The brain will produce a characteristic electrical pattern if it hopes to get something which is nice or neutral or if it hopes to be right in any case.

ROCHBERG: Dr. Walter, as you were speaking about the transitive adaptation process, you said that ultimately the act of creativity (as you think of it) is antibiological. Suddenly into my mind popped the thought, the opposite thought as I understand it from Chardin, which is the end result of the mental evolution of the movement from matter through life to mind. Could you explain how one could think of these two opposite terms and come up with something which could still be meaningful without cancelling one or the other out?

WALTER: My parenthesis about "biological effects" of this was conjecture. Assuming that the notions of biological evolution are correct (and mind you, there are a great many doubts and uncertainties and discrepancies in the theory of evolution), then we have to suppose that, in general, survival depends upon better adaptation to a changing

environment—better, not in a moral sense, but a more effective match between the organism and the environment. This implies that the environment is producing effects all the time—the climate is changing or something is occurring whereby natural selection operates as an amplifier of variation. Now, suppose that by the act of creative invention we could discover how to control world climate absolutely so that there would never be any more changes in climate unless we desired them. The effect of climate upon human and indeed all evolution would become minimal, and therefore the probability of any mutation being more fit, better adapted, would be smaller and smaller, and the rate of organic evolution would become less. We would all end up as species in an extraordinarily static biological condition. We might continue to evolve in other ways provided that other aspects of the environment exerted selection pressure. In fact I have a hunch that our desire to climb mountains, take drugs, explore the icecaps and outer space, to expose ourselves to hostile environments, may be due to our having acquired a degree of environmental control. By creating a habitat we have short-circuited the force of natural selection and we are forced to create new hazards and fresh challenges by forces we understand as little as our ancestors did the motions of the planets.

MANGIONE: Dr. Walter, toward the end of your comments you made the point that concentration leads to excitation of the brain or induces excitability in the brain, and of course we equate that with the act of creation; that is, I'm thinking particularly of writing. On the other hand, there is ample evidence to show that when there is no concentration, some writers receive what I consider "psychic windfalls." But Housman informs us that he drank a pint of beer at lunch, beer being a sedative to the brain, and then went for a two or three hour walk. He would go along, thinking of nothing in particular, when there would flow into his mind with sudden and unaccountable emotion sometimes a line or two of verse, sometimes a whole stanza at once.

WALTER: Yes, I think this is perfectly possible. I don't say that concentration is the only way to creation.

MANGIONE: Is there any explanation for this?

WALTER: Well, this combination of alcohol, water, and a long walk, seems to provide a good physiological situation. Very often, in the accounts people give of inspiration, if you go into details of what they actually did, you find they are inducing very odd physiological states. Often fasting, for example, with the consequent hypoglycemia, is a good way of getting into a peculiar state of mind in which associations

are more free and easy and hallucinations may provide a sense of insight and inspiration. Obviously the currently fashionable drugs may do the same and alcohol and opiates have a long history as artistic stimulants.

MANGIONE: Is that a manifestation of excitability?

WALTER: Yes, in the intermediate stages of hypoglycemia or intoxication by alcohol or opiates the brain starts producing slow waves, and it's quite possible that the combination of the water and the alcohol had this effect. I don't mean to be flippant about this; I think that the physiological states that accompany creative acts are very interesting to discuss in detail. As I said, fasting is one. For example, the poet in his garret who is underfed, underexercised, underprivileged (as we say now), may get himself into a state in which hallucinations and fantasy can supervene in such a way that all he has to do is collect the lines that scan or rhyme or whatever is fashionable. I'm quite sure Housman had a great many lines of this sort that appeared to him that didn't, in fact, fit his prosody, and he imposed upon them his rules in order to get them into poetic form. The interaction between fantasy and logic in the scientist today, which is a product of the computer age, is rather like the interaction between the poet's imagination and his rules of prosody. Even the craziest idea must somehow be tailored to fit the rules of logic or prosody before it can be published. The economies of this are interesting: if the tailoring takes too long, one cannot afford to have a fantasy. A scientist, like a poet, must publish or starve. Well, with a computer the tailoring can be done in seconds where a few years ago it would have taken nearly a lifetime, so we can afford to entertain crazy notions and retain the ones that satisfy some criterion of logical plausibility as indicated by a computer.

MANGIONE: Eventually the poet may not have to worry about rhyme. Some of the things can be worked out by computer.

WALTER: Yes, I wrote a poem, here last year. It's just a jingle, suggested by Mrs. Garrett's book called "Many Voices." It is a poem about the brain and it's an example of the way in which one can afford to develop a fantasy which may suggest experiments. It's called, "Odysseus Looks at an EEG." Mrs. Garrett and I have a little private fantasy about classical personages. The character here might have been Zeus, but in this case it's Odysseus, at the stage of his wanderings where he was cast up on the shore of Phaeacia and was picked up by Nausicaa.

Your brain is a big country,
It speaks with many voices.

I hear the murmur of your private gossip,
I see the gulfs and headlands of your coastline.

I hear, too, the surf of my private sea
That foams and curls around your promontories.
Are your voices the echoes of my billows?
Is there a single voice that speaks in my tongue?

How long must I stand off, back and fill
Where are your shipwreck on the reefs of your body.
Raising my gaze, I seem to see a range of mountains
Far in the hinterland of your country.

Are there people there, who gaze down at me?
See my cockle-shell bobbing far off
Wonder what creature would dare to navigate
These uncharted shallows?

I see no harbor; no man-made jetty.
If I'm to feel the crust of your country
I must sacrifice my craft
Run the breakers naked; throw myself breathless
On your beach.

Will a princess come with laughter and garments
Welcome me to the circle of maidens?

SERVADIO: Thank you, Dr. Walter. Dr. Bleksley?

BLEKSLEY: There was one remark that Dr. Walter made which illuminated something in my own mind and I would like to clarify my thinking on this, if I may. He pointed out that psi exists as a weak force in our experience, and then he went on to say that in spite of that, it could affect a stochastic universe, our stochastic processes in our brain. Now it seems to me not irrelevant that so much of the research in psi has been precisely along those lines in which psi has been confronted with stochastic processes. Think of the type of experiment that is normally used to investigate psychokinesis in which one throws dice. Now this is inherently a stochastic process. We know there are mechanical laws underlying the fall of the die, but the fact of the matter is that the process itself is fundamentally stochastic, and somehow of all the experiments that have been attempted to demonstrate psychokinesis, the most successful, for what they're worth (I'm not sure they're worth a great deal), have been precisely these in which you've been dealing with a situation such as falling dice. Now, I wonder whether Dr. Grey Walter has given this matter any thought? Would you feel that this is a legitimate conclusion, that weak forces

are liable to demonstrate themselves more adequately against a stochastic background?

WALTER: I would call the processes that control the fall of a die literally aleatory rather than stochastic. This is a common term in French, less so in English, but it means literally to do with the throw of a die, and I would say that all natural forces are aleatory whether in the nucleus or the fall of a meteorite on the macroscale. Also they may be deterministic by Newtonian factors and yet unpredictable in practice because of the delicate balance of forces and the time scale on which they operate. I suppose it is possible that the interaction of two weak forces would occasionally produce a strong effect, that is something more than a slight statistical bias. This may be why so much psi-research has been done with aleatory processes such as card-turning and dice-throwing, yet so many of the striking effects are isolated anecdotes.

CHU: I want to ask Dr. Walter if he would clarify the biological implications of the general statement, if true, that on the whole, Oriental philosophies emphasize the adaptation of the organisms to their environment, whereas modern occidental philosophy emphasizes the reconstruction of the environment to suit the organism. Are there biological implications to this generalization, if true?

WALTER: I would be tempted to adopt what I suppose might be considered a Marxist view. Socio-economic conditions in the Orient at most times were, by our standards of present Western life, very rigorous and the pressure of survival was very great. There was no question, really, of controlling the environment, and the only possibility was to adapt the organism, for example, by fasting. The discipline of Yoga is very well adapted to a famine-ridden country. One of the features of the yogi is that he can do without food and drink for long periods, almost to simulate death. In a country where early death is a commonplace experience, to simulate it may have survival value. This may be a trivial explanation and insufficient, but I think it is a necessary part of the explanation. The reluctance of the Oriental to influence or control the environment and his actual inability to do so may have a common cause. The economic and social development in the East as compared with the West encourage the cultivation of practices which adapt the organism to a situation of scarcity. We are able to assist at this conference because of our affluence. This couldn't happen in any other culture. The Academy of Plato was fairly well off. Most of the Greek philosophers were fairly well heeled and they could afford

to stroll around the Academy, but the majority of their contemporaries could not.

CHU: In that case, biological adaptability, though the goal of evolution, is not really a human goal.

WALTER: No, indeed. It may not be a human goal. Even if we assume as a first approximation that there was something like a human goal in evolution, then our preoccupation with creativity, in the sense of developing our environmental control (not merely physical controls like jet planes and telephones and central heating but also ideational control) could re-set the apparent goal of human evolution onto an entirely different plane.

MARGENAU: I was a little disturbed over the fact that Dr. Bleksley and Dr. Walter reached agreement with respect to the identification of forces and stochastic manifestations of these forces. I wonder if this should not be re-thought. It's true that there are stochastic manifestations of the gravitational force, but on the whole, the gravitational force being weak gives rise to exact motions of planets, stars, etc. In other words, the first solutions of exact differentiations or differential equations in the world were manifestations of the gravitational force which you say is weak. This contradicts the statement that weak forces have stochastic effects. Some of the forces causing radioactive decay are indeed strong nuclear forces. Radioactive decay is surely a stochastic phenomenon, so the counter-argument that strong forces may also create aleatory effects, I don't believe is on the whole correct.

WALTER: But I think there is a point you omitted—that the equations which satisfy the requirements of planetary motion in terms of gravity are dealing with enormous masses.

MARGENAU: Yes. That's true.

WALTER: Whereas your radioactive force is dealing with very small masses. The gravitational forces do not have to explain the movements of small particles.

MARGENAU: But the gravitational force would apply to a single particle also, to provide a solution for a differential equation, so far as we know. But I was perturbed by other forces.

WALTER: I mean, the strong forces do not influence the motions of the sun, moon and stars. They are not relevant except insofar as they keep the matter together and at the same time exploding.

MARGENAU: We're talking about the gravitational force alone, which, so far as we know, can be applied to any mass, and if it acts alone, it will provide exact motion—that is, a motion that is not aleatory.

WALTER: But it cannot be demonstrated in small masses.

MARGENAU: This is quite true. Your example of the space ship is perfect here. I'm not questioning that. I'm against the general supposition that weakness and probability always go together.

WALTER: I would say because the probability is always there. I think the word stochastic is used in two senses here. I use it in the sense of "aimingness," rather than "randomness," because the Greek word definitely means "aiming at a mark with an intention to hit it, but the expectation of error."

SERVADIO: Dr. Meerloo, please.

MEERLOO: I want to say something about a confusion that may be in our minds about the words "weak forces." Because sometimes it may be that "weak" can have a strong effect in the question of direction and also in relation to the word "creativity." For instance, we talk about weak forces, but it may be that weak forces change completely certain special structures and add complications. I think, for instance, about the question of civilization itself—is it a weak force or a strong force? I mean, the primitive suddenly starts a painting on the wall and gets a tremendous power, but his power is not a physical power. It's a power of exchange and magic. At this point, we can't express it in physical terms but obviously it changes something in the structure of the human exchange. And I believe that weak forces, which we know at least in psychology, can completely change a structure even though we can't express it in energetics.

WALTER: I never suggested that creativity was a weak force. If one wants to think in terms of forces (there's no reason why one should, particularly in this case), if one thinks of the effect of these things, obviously a creative act, I suggested, must be effective. That is, I mean by transitive adaptation, it must do something, but it may be initiated by a stochastic event; an event which is improbable but which does, in fact, occur and which can't be predicted precisely deterministically from previous existence.

BLEKSLEY: With respect to this question of weak forces in relation to stochastic effects, I wasn't suggesting for a moment that weak forces produced stochastic effects. I was suggesting that this might be one for identifying. The other thing that I had in mind was this: If I were

fortunate enough, I could poise this object in unstable equilibrium on its point. I'm unlikely, at my age, to have the sort of steadiness of hand to do this except by sheer chance, but if I were to so poise it, it would require only a very brief force to disturb that, a very small force, and the difference between the force acting in that direction which causes it ultimately to end up in this position, and an opposite equally small force to cause it to end up in *this* position would cause fundamentally very large differences in the final result. In other words, a weak force can produce very large major disturbances in a situation in which almost anything can happen, and then, in fact, one thing is produced. Now that to me seems to be the essence of the type of tests that are carried out in psychokinesis. You don't need to throw a die very differently in order to get a six or a one, but a six is a very different answer from a one, isn't it?