

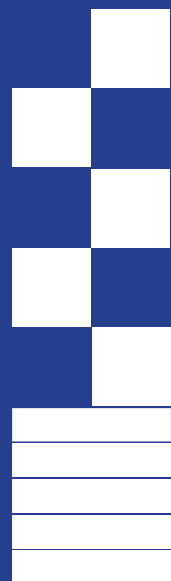
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Creativity: Process and Personality

Larry Gross

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with a new
preface by
Larry Gross



Larry Gross

CREATIVITY

Process and Personality

A MEDIASTUDIES.PRESS PUBLIC DOMAIN EDITION

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Chapter IV: Milton Rokeach: How do People Believe?

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"I THINK THERE IS A CERTAIN single-mindedness about me that is almost a major, dominant theme in my life." This statement, which would not have been atypical for Herbert Simon, is central to an understanding of the work of Milton Rokeach. More than any other of the six psychologists we are considering, his work is centered around a central theme that runs in almost musical fashion as a leitmotif through his life and professional career. It is a theme that is first introduced in the recounting of his childhood, while variations upon it recur in all the subsequent phases of the discussion. This theme, as in the case of Simon, can best be phrased as a question, "How do people believe? What is the nature of human beliefs?"

Milton Rokeach, at 45 one of the youngest of the subjects in this research, is professor of psychology at Michigan State University. He is best known for his book *The Open and Closed Mind* (1960). He has also written articles, a monograph, and a second book *The Three Christs of Ypsilanti* (1964). I interviewed him on August 21, 1963, in East Lansing, Michigan; the interview lasted four hours on tape, although during the two days I was there, there was more, unrecorded, discussion which I shall draw upon in this case study. The interview was conducted according to the outline given in Chapter II above, and the presentation will, by and large, follow that format.

CHILDHOOD—EDUCATION

The religious element in his background was, I think, more influential in Rokeach's development than in any of the other subjects. It is, as we shall see, directly related to the "dominant theme" of his life. It played an important role not only in his home life, and relations to his parents, but in his early schooling as well.

"I think that my early education in the Yeshiva, in Brooklyn, was extremely influential in the sense that I rebelled against it all the time... And yet, I was an excellent student.

The main game I played in the classroom, in the yeshiva situation, was to demonstrate the superiority of my understanding of the material, but also to find flaws in it. Both to demonstrate my understanding, and also to find flaws in the talmudic arguments on various issues. I learned early in life in the context of the yeshiva, maybe this is what I want to say, that if you ask a question that has been anticipated and asked in the Talmud, been asked by a rabbi before; I learned that this makes you a very smart boy and you are greatly rewarded. On the other hand, if you ask a question which has not been anticipated, and which has not subsequently been discussed in the writings, you are a doubter, an 'epicurious' (talmudic term, derived from 'Epicurean', meaning skeptic or apostate). Not that I formulated it this way as a child, but that somehow I felt the double pull—on the one hand wanting to be rewarded for anticipating a question asked by the rabbis of old, and on the other hand discovering that I was punished whenever I happened to ask a question that was not anticipated in the Talmud. In the sense that there was no answer. The rabbi in the classroom couldn't give me an answer, because it wasn't in the book. In any case I developed a love of intellectuality, but not this kind. And I knew there had to be something beyond this."

While the talmudic influence on his intellectual development was certainly considerable, both in method and in the sense outlined above, of emphasizing intellectual matters; it also was a source of much of Rokeach's distaste for anything at all dogmatic or orthodox. The passage above gives one reason for his early disillusionment with the beliefs of his home and school. Another incident which he considers crucial in this area happened about the same time.

"An entirely important personal influence, or at least incident, occurred when I was somewhere around 8 or 9. I was already living in Brooklyn (in Williamsburg), and around the corner was a group of gentile boys, and it was generally considered unwise for a single Jewish boy to venture alone in that direction. But one day I did, and as I returned back to my home bailiwick, I was surrounded by a group of gentile boys. And they asked me, 'Who goes to heaven?' That was the question. And seeing that this was a rather loaded question, shall I say, and not wanting to be beaten, I thought quickly and said, 'Well, you see, there are two heavens, one for the Jews and one for the Christians.' And strangely enough I discovered that they were satisfied with the answer and let me go. But as I walked away I was struck by the novelty of the idea and then I leaped to the third and fourth steps. If there are two, why not three? Because I already knew about people who were neither Christian or Jewish. And if there are three, why not none? And I think from that day forward I didn't believe in heaven. And I also knew that this was something that I could not discuss with my parents. So this insight is symbolic of many, many things. But I think I also knew, 'How do you know?' If there was no heaven, and if there were rival claims, how can you really tell which is the real truth? So maybe my research on the open and closed mind, and on belief systems began with that incident. I think that would be a reasonably accurate statement to make."

Whether it is tenable to grant that the research that resulted is the belief system theory began at that time we certainly cannot say, but I think we can see here one of the introductory expositions of the theme that found its eventual culmination in that work. The incident demonstrates both the subject's curiosity as a child, his tendency to ask questions that violate previously held beliefs, and his recognition that in this he was detaching himself from his parents and their world. This theme is developed in two other incidents he related in discussing his intellectual development as a child. In these, too, he showed himself to be very aware of their continuity with his later life. While this is not the place, nor am I competent to establish the verity of this sensed continuity, I think that the subject's feeling is certainly relevant in our consideration of his growth as a thinker.

"I think that I was an extremely curious child, and had no place to satisfy my curiosity. And this is important—there was no place to go. My parents, other than what they knew about religious truth, knew very little about the real world in which they lived, and if I had any questions about the real world, I somehow learned, then there was no point in asking them for an answer. And so it was that when I had some curiosity about things that bothered me, I would often try to get some answer myself, without asking anybody. I think it was about the same time that I did my first research, and where I first learned about the difference between phenotype and genotype. I remember how puzzled I was when we crossed the ocean, in a Cunard Line boat. 'How the heck does the boat know where to go?' and also 'how does it happen that the big fish beneath the waves don't bite a hole in the bottom of the boat and sink it?' Well I evolved the hypothesis, a childish hypothesis, that answered both these questions. First, there were tracks laid beneath the waves, and second there were knives attached to the bottom of the boat, so that if any fish approached it would get cut."

"The second incident is really quite similar to this, and it involves my first experience with a phonograph. When you look at a record, and you put it on and it plays a particular song, you ask yourself, 'How is it that it plays this piece rather than any other piece?' 'And how does one record differ from another?' The only difference that is apparent to the eye is what it says on the label. So I evolved the theory that you could make a record play anything you want it to play simply by switching labels. And naturally I tried the experiment. And this taught me a very important lesson that I will never forget, except, don't misunderstand me, I didn't articulate this way, this was felt intuitively rather than in any explicit way, and I was somewhere between 8 and 10. I think I became first of all a doubter, with the heaven incident, and second, a researcher, with the phonograph incident."

When I asked Rokeach about feelings of apartness, isolation, difference, etc., referring, in my original intention and as the other subjects also assumed, to relations with peers; he first answered with respect to his parents. This is congruent with the impression

given here about the nature of his home environment. He felt apart from his parents more strongly than the other subjects, except perhaps Maslow (see Chapter V), and this, too, is related to the issue of religion. It expressed itself in the feeling that, "I knew I couldn't discuss things openly with them."

"I was not particularly close to either of my parents. Probably had a great deal of hostility and resentment, particularly toward my father. And here again, the discrepancy between the humanitarian, wise qualities that a rabbi would be supposed to have, and his harsh treatment, disciplinary treatment of children, and his childish temper, which he couldn't control; impressed me, I think, very much. I saw the hypocrisy. And this was to become later, in my professional life, a preoccupation with the relation between structure and content—what is said, and how it is said."

Feelings of apartness were also fostered, or, rather there was an attempt at this by his parents in another sense. "I think my mother inculcated in me, or more accurately, attempted to inculcate in me a feeling that not I personally was superior, but that Jews as an ethnic race were. No, I take that back. That I personally was superior. She continually bombarded me with the fact that we were direct descendants of Maimonides, the great Jewish philosopher. So, not only did I feel different, but I don't think I bought it. I don't think I ever believed what she told me. In the way that possibly some of my siblings did. In fact, I rejected these notions. I felt repulsed by the notion that I was superior because my ancestors were this or that. I somehow had the feeling that what I was, was up to me, not up to what line of distinction I descended from."

The other important reasons for feeling apart, different, that Rokeach mentioned had to do, first with physical factors, and second, with intellectual abilities. We have encountered these already with Simon, and will encounter them again, with others of the subjects.

"I kept pretty much to myself, for two other reasons. I was, as a child, pretty short for my age. Smaller than other guys were. I only caught up later, when I was 13 or 14. And I found that I was not sought out by other children as a playmate. And, secondly, while I was an excellent athlete—touch football, handball, punchball, etc.—and participated very often, in the streets, and at Coney Island; while I had this in common with the other kids, I found the horseplay of peer relationships didn't interest me. There was very little serious talk about things that matter. I enjoyed the sports, but then we didn't have anything else to talk about. And so, other than one particular lifelong friend, there was no one else to talk to, through adolescence and into college. I read a lot, but the reading wasn't particularly guided by anybody—whatever I could get my hands on. My younger brother would play poker for Tom Swift and Tarzan books, and I would read them as quickly as he won them and return them to him so that he could play with them again. I was doing the reading, he was doing the gambling, sort of a division of labor. But what I read was indiscriminate—whatever happened to change hands in a poker

game. And I think I have always regretted the fact that I spent so many years reading junk, when I could have spent the time reading something of greater literary distinction, had somebody been there to guide my taste. But after all, I was reared by immigrant parents, and where would I learn these things? And, I suppose, in a sense, that isn't too atypical of others in similar situations."

I think that at this point we can obtain a fairly good impression of the important influences of his early environment upon Rokeach's intellectual and personal development that is sufficient for our investigation of his character as a scientist and thinker. There is a significant degree of continuity here of preoccupation with one or two important questions that will dominate his professional life. This is supported by his conscious opinion and recollection. "The orthodoxy of my background is to play an extremely important role in my professional life. If you just extrapolate on this point to *The Open and Closed Mind* and what not, you begin to see it. My interest in dogmatism—you don't have to do much psychoanalytic interpretation to see the influence."

The rest of his education we can deal with fairly briefly, for the important aspect of the early schooling has been illustrated already, and the later influences will be dealt with subsequently in a later section.

"I went to Yeshiva till I was about 12 1/2, and one of the happiest days of my young life was the day we moved from Williamsburg to Flatbush, because in the moving I moved so far away from the yeshiva that it was impractical to go there. And from that day on I went to public school, although I was made to continue my Hebrew education at least for another year or two. And my private Hebrew education was finally terminated when I asked the rabbi why it said in the Gemmorah (one of the talmudic texts, not one of the cities of the plain) that the succah had to be 19 hectares, or whatever, high. I said that 20 seemed like an easier number. And he said something like, 'Uh, well, that's as high as you can see.' I disputed that, at which point he got very angry and left, and that was the end of my formal talmudic education."

"Public school in Brooklyn, Boys High School, Brooklyn College. From there it is no accident that I ended up in Berkeley, which is about as far away as one can get from Brooklyn. I also worked in a factory at night, while I was going to Brooklyn College, in Flushing. I spent many hours a day traveling, three hours, not because I needed the money, my parents were sending me through college. But, I was really saving in order to have enough money to leave home after I finished college. And that's exactly what I did. With the \$400 or \$500 I managed to accumulate after working, I left for Berkeley and went to graduate school there. I got my Masters in a year, that is, in December of the year I graduated in January. Because of Pearl Harbor, I saw myself going into the army."

"Almost four years in the army—Army Air Force Aviation Psychology Program—in which I received a great deal of practical training in research, learned a great deal about

various kinds of procedures: selection, validation, job analysis, classification batteries, factor analysis, etc. Then I returned to Berkeley in 1946, around March, at which time I felt that too many years had been 'wasted,' so I hurried up and got my Ph.D. between March of '46 and August of '47. I was a young man in a hurry, I guess."

BECOMING A PSYCHOLOGIST

"I guess I was always cut out to be a psychologist. I never really wanted to be anything else. Except in my youth when I wanted to be such things as a radio announcer or an astronomer. (There might be some psycho-analytic significance in the choice, atypical I think, of those two professions. A radio announcer—one who tells the world the 'facts' the 'truth' about the world. An astronomer—a scientist who explores phenomena removed from this world, and from any ideological content. So much for amateur speculation.) But aside from these childish kinds of ambitions, I more or less assumed, when I was going to college, that I would become a psychologist, because this is what really interested me. I never wanted to be a doctor, I have sometimes thought that I might have wanted to become a physicist, but because I was working at college, I had to take courses with minimum lab work. So this automatically excluded physics from consideration. It was even difficult to find time to take the experimental psychology course. And yet, I managed as an undergraduate to do a considerable amount of research, far more research than many students do in their graduate career. And I was extremely interested in research."

Rokeach studied psychology at Brooklyn College in the late '30's and the early '40's. There he was under the influence of two teachers in particular. "The two teachers who influenced me most at Brooklyn were Maslow and Asch." These influences were to be important in his professional development, more in structure to use his term, than in content. Both were, at that time, young and also just beginning their professional careers. Neither were as well established as they later became, yet already they had distinctive styles and methods. Both of these facts are, I feel, important in understanding Rokeach's attitude towards his two teachers. For, as we shall see, he was always wary of being caught up in another's backwash; and here there was not yet so much of a danger of this, although they were both extremely popular and admired teachers at Brooklyn. (This is based both on Rokeach's and on Maslow's reports.) Rokeach's recollections of the influence of Maslow and Asch at Brooklyn and others at Berkeley, are important in tracing the development of his ideas and research. For if the former provided a good deal of the structure, the content is clearly related to the work being done in the '40's at Berkeley, especially on the authoritarian personality.

"I sensed that (Maslow and Asch) were not necessarily seeing eye to eye on a great number of things. I was attracted to Maslow's kind of psychology because even though

it was methodologically unsophisticated he seemed to be asking the right kinds of questions, or my kinds of questions."

"I was attracted to Asch because it was more methodologically sophisticated, and yet, while it didn't ask exactly the kinds of questions that I thought were relevant to an understanding of human personality, at least I thought so then, it was sufficiently relevant. I think the main difference between them was one of rigor. And in both cases I found myself both attracted and disagreeing with them, so that I probably ended up creating an impression in both of their minds that I was a very argumentative and quarrelsome kind of person. Which I am."

"I might point out that it was Asch's denial of the importance of personality and the insistence on the importance of the immediate field conditions, which eventually led me to do my doctoral dissertation on the relation between prejudice and the *einstellung* effect. It has the Asch influence in that it is dealing with the *einstellung* effect, but it is a protest against the sole insistence on the field playing a part by showing that people with different attitudes behave differently in the same situation. Thus I think starting a line of research I would pursue for many years, designed to demonstrate the role of personality in cognitive functioning in general. And *The Open and Closed Mind* would be the culmination of that line of thought. Almost a single direction. So there is a singlemindedness in all the research. I think there is a certain singlemindedness about me that is almost a major, dominant theme in my life."

"When I got to Berkeley I was extremely attracted to Elsa Frenkel-Brunswick and Nevit Sanford, with their heavily psychoanalytic orientation. But again an ambivalent attraction. Attraction because they were asking questions that interested me deeply; negative attraction, holding off, because of reluctance to commit myself completely to the psychoanalytic tradition. It seemed too easy to account for too many contradictory facts. It was easy to explain everything by psychoanalysis, and yet it seemed that there was a great deal of validity in psychoanalytic thinking. And I would say that we now have the Gestalt influence (through Asch), and the psychoanalytic influence, and the Maslovian influence; and I ended up by never embracing a single one of them. Finding things I liked about all of them finding things I disliked about all of them, and finding my own resultant, where I think you will see traces of all three."

Rokeach's compelling aversion to the possibility of becoming a disciple of another's views was not limited to the sphere of personal contacts. It extended to the study of established methods also, as in clinical psychology. Here, if anything, the aversion was even stronger, almost, one might think, phobic.

When he went out to Berkeley Rokeach was planning on specializing in clinical psychology, despite (or because of?) warnings from his teachers at Brooklyn that it would be difficult for a Jew to work in this. "I paid not the slightest attention to this." What changed his mind, was rather the nature of the required training.

"I took a course on the Stanford-Binet in which I was made to memorize the entire test, down to the last comma and semi-colon. While I managed to get an A out of the course, the thing asked of me was so repulsive, for exactly the reasons you now ought to know, the catechismic approach, that I wanted no experience like it ever again in my life. It literally traumatized me. I did not want to give another test again in my life. And, I might add, I have constructed any number of tests, but they are all my own. I was not about to learn somebody's Rorschach or anything else, because then I would be made to learn it and present it in a way somebody else wanted me to, rather than for any reason of my own."

The question of being taken into another's fold came up again and again in discussing his professional training. We shall see it in response to the query about learning specific things from specific people, and acceptance of other's ideas (Chapter II, section I.C., above).

"I think I have always learned specific things from everyone I have ever been in contact with. Every single professor taught me something, not necessarily the same thing he intended to teach me. I may have ended up learning something as a result of having had contact with a professor rather than what he wanted to teach. And I think that this is what I needed professors for. Rather than to be indoctrinated, to become their apprentice, or disciple. Which is what all my professors ever wanted of me. Or, I would rather say, this is my fear, my fear that they would enslave me to become their disciple, quite aside from whether they wanted that kind of enslavement. After all, I would deny that this is the kind of thing I want from my students. But my students might not agree with me on this."

"Acceptance of ideas, that's a pretty important question. Again, every professor I met, and that was important to me, I always felt that this was an issue that lurked beneath the surface. Where what they wanted of me was an orientation much like theirs, and I held out, not capable, or able, or willing to give that kind of response. And I suppose that in the end, the contact of everyday interaction, the things that bothered me, when vocalized, would easily have given them the impression that I was disagreeing with them all the time. Actually these were the things I chose to discuss with them. I probably, again, formed in them the idea of myself as a very argumentative fellow. In that context I would hardly blame them for never realizing how much they influenced me. Because all they saw were my resistances to their influences. The points that I didn't resist were a less salient feature of our daily interactions. Never had any conflicts with teachers that were other than these kinds of things, which means quite a bit I guess. That is, refusing to believe the truth as formulated by the professor in his writings or in class."

Rokeach's militant independence has not diminished in his intellectual career, he is still jealous of his professional sovereignty. This is no less true of his political views.

"All my life, having rejected orthodox Judaism, I kept looking for something else in which to believe, if it wasn't this. Naturally, being brought up in Brooklyn and going to college there, I became acquainted in the '30's with all kinds of radical ideas and was forever flirting with them; but never could come to the point of letting myself adhere. I was deeply impressed with the Marxist philosophy, certainly to the point of never being able to get too far away from it, and yet never being able to get close to it. Therefore being trapped in a sort of state of equilibrium in that direction. And I guess the reason why I could never bring myself to make the complete leap, was feeling that I would be subjecting myself to a dogmatism, the very thing I was trying to flee from in the first place."

Once established as an accredited scientist, a teacher in his own right, Rokeach has been able to work closely with other psychologists, but now as a colleague, a peer rather than a student. Whereas he has not ever collaborated (to my knowledge) with teachers, he has collaborated a good deal with colleagues and students. But always more or less within the limits of his own general lines of research. This is, I think, characteristic of all of my subjects, as we have already seen in Simon's case. Most of the collaboration they have done is within their own bailiwick, whether or not this is true of their partners, without, I think, necessarily imposing their views on these colleagues.

"Collaboration. Here I think I am luckier than many other psychologists who have collaborated. I have never had an unpleasant collaborative experience in my life. And I think the reason for it is that I have seen collaborations among colleagues and teachers which have sometimes turned out bitterly and I was determined that I would never be involved in this sort of a situation. And the way I managed to avoid it was to lean over backwards in every instance, and if there was ever a question about joint authorship vs. a footnote, always to resolve the doubt in favor of a joint authorship. And this still continues to be my personal policy. And so it is that my book, *The Open and Closed Mind*, has a great number of collaborators, although I wrote every single word in that book, and no one else wrote a word of it."

"I have collaborated with more people here on the staff (Michigan State University) than anyone else on the staff. Apparently I have developed, unwittingly and unconsciously mind you, the capacity to talk to other people, discover that we have something in common; and somehow this leads to a cooperative effort that is mutually satisfying."

"In recent years more and more of my work has been collaborative, in particular where it involves empirical investigation, and the reason is rather obvious. The demands on my time become heavier and heavier, and while I like to keep close to the date, I get involved in too many things, and haven't got the time. And this is where I feel that not only colleagues, but students are a very important part of my intellectual scientific and professional life." Apparently his students are less worried about enslavement than he was.

Rokeach's view of teaching is also related more to the benefits for his thinking than for the actual joy of education. I think this is fairly common for my subjects, and is probably indicative of a difference between the creative thinker who values teaching as an intellectual tool for his own thought and the creative teacher (I am not implying that my subjects are not creative teachers, but I think this is not the area of their major interests) who is interested in teaching for its own sake.

"The seminars I have taught at Michigan State, on my own research, have been extremely important to me intellectually and so on, not so much because of the fact that the students have always been brilliant; but because it provides me with a platform, and a context in which I do not feel inhibited to discuss my preoccupations. And in the process of discussing it, I discover that certain things I have presented in a bulldozing way, in a way that doesn't even convince me; and which things felt right in the process of communicating."

Simon mentioned the same kind of feeling about teaching, in that the process of presenting theoretical material was one in which he was able to discover weaknesses that had gone unnoticed before. In general, it seems to me that this mode of teaching, the presentation of the teacher's own original theories, even in the formative stage, is probably the most useful and interesting I have encountered, and the one I have benefitted most from. The opportunity, as Maslow once put it in a course he taught, to "look over the shoulder of a scholar at work," is both a privilege and a rich learning experience. I think it is significant that all of my subjects report such an attitude.

Rokeach is very conscious of the opinions of other psychologists on his work. This is expressed in a valuing of feedback and criticism, as well as in the interchange with colleagues in discussion and collaboration. This is congruent with his consciousness of the relative nature of beliefs.

"I think another psychologist you might talk to might say, 'I ain't got no place to go, I work alone, nobody likes my work, it's a hard life.' This isn't true of me. It's true, it's a hard life, in that there is only too much willingness to knock down somebody else's work, and this has happened to me often enough; but I am able to compensate for this, and get other feedback which gives me the spirit to go ahead and fight my battles. I think I am like anyone else, very sensitive to severe attacks on my work, but I get enough other gratification so that I don't have that experience too much. I am sure that Maslow gets his attacks, and Skinner does, and this is a necessary part of professional life. But with time, I think I can repress or ignore the personal attack, and pay more attention to whatever it is that is substantive. There is no substitute for the continual interchange, interaction process, with hurt feelings if necessary, for the advancement of knowledge. I can't imagine any other system that would do it better."

None of my subjects felt that they were confined in their professional lives to the ivory tower, and Rokeach in particular feels a close connection between his research and the "real world."

"That relates to where I get my problems from, and I think I get them from life. I have always refused to be distracted by other psychologists who draw problems solely from theory and by a purely derivational process. The point of departure for everything I do is somewhere else than theory, then I relate it to theory as best I can. And I think I could be less accused of living in my ivory tower than most psychologists. In fact one of the comments made by NSF in giving research grants is that by definition I have to consider topics that are extremely volatile in the real world, as part of my basic research material; and were I to pick other topics, less controversial, it would deny the very thing I am proposing to do. And I feel pretty good about this."

MOTIVATION AND PERSONALITY

"I am a high need-achiever, probably extremely high. Why? I think my Jewish cultural background is extremely relevant. It was a source of reward and gratification, not only in terms of my cultural background, but in terms of the actual experiences I had, in discovering the big fuss that was made over me when I was able to anticipate a question that had been asked by a rabbi in the past. The reward was enormous."

"Sense of destiny, yes! I think a strong sense of destiny, always a feeling that what I was doing was important to me, and should be to others. Crusader's zeal? Only in the sense that when you combine high achievement need with a sense of destiny that's what you end up with. I don't really think people are interested in other people's ideas, unless you give them some damn good reason why they ought to be. And it's up to you to do so. If you don't why should they be interested, there is too much competition in the world of ideas. In that sense crusader's zeal—a vigorous attack to present one's ideas aggressively."

"Messianic fervor? I have no sense of the prophetic. It may sound paradoxical, but today's ideas and fads give way to tomorrow's, and most of the work that's done by people dies with them. I believe this rightly or wrongly. Unless the work is overwhelmingly important, like a Newton or an Einstein, that perhaps little bits of knowledge remain, but the theories die and give way to new ones. I rarely think about these things, and I guess I don't care about them. I don't care about what happens to my work 20 years after I am dead, or for that matter, a week after I am dead. That is someone else's worry. If it is good, it will live on, if it's bad it won't. Either way it's nothing that concerns me. Although what does concern me is that I do what I want to do, while I am alive; and that must be the best that I have to give. Once I've decided that I have given the best that I have, I no longer worry. Because I say, it's the best I've got, beyond that I couldn't have done anything better. So that's why I have no messianic feelings."

It is not at all surprising after what we have seen of Rokeach's life and thought up till now, that he should enjoy the role of the iconoclast. In fact this is central to his view

of his work. "The enjoyment of the iconoclastic role, enormous. Nothing delights me more than to play this role. More and more as the years go by, I feel that it's not only important to present new ideas; but it is important to present them in confrontation with alternative ideas that are also in vogue, that somebody is also committed to. And what I enjoy is the process of confronting alternatives with each other, and seeing if it's possible to say which is better, more true, more valid, etc. I say, 'You've got an hypothesis to account for this, I've got another one. And mine's better than yours.' That's when I am in my element."

"It is a talmudic method where the ultimate authority is logic, scientific method and scientific data. But the pitting, I think this is crucial for the way I think. Why is this important? A good criteria for something's importance is that it contradicts something else, which claims to be its interpretation. Not only do I feel that it is extremely gratifying in scientific work, but also in teaching. You can't avoid confrontation because of the way we have formulated the subject. And I find this very nice. This is one of the first questions I ask about anything I do, 'What's the issue? Who cares?' And as soon as I discover that it's possible to state alternatives, now I know I am on the right track. Of all the problems I could be working on, that's the one that deserves working on."

"I think I would want two places to give the credit for this kind of dialectic. One is the talmudic background that I sort of soaked up. The other is that Asch uses it. And I was impressed with it. But for him it's always the same issue, no matter what the subject—behaviorism versus gestalt theory. What does behaviorism say about it, and what does gestalt say about it? And he can organize quite a bit of stuff in terms of these alternative interpretations. I want more specific stuff. Molar vs. molecular, structure vs. content. What's structure? What's content? There are different ways of talking about these, what are they? What's the argument about?"

"On the other hand, the vast majority of psychologists I know, will avoid controversy like the plague. Thereby making their work important only in its own light, out of context with anything else, and not relating it intellectually to anything else. Even though there may exist other things with which it conflicts."

The use of this dialectic iconoclastic method of confrontation is related to the emphasis on independence that is so strong in Rokeach's discussion of himself, and is so prominent in his work. His definition of creativity, as presented in Chapter I above, places great stress on the necessity for independence as a prerequisite for posing the creative question. By this point it is not astounding that he should feel very strongly about his own independence.

"Independence is extremely important. I would say that I have always been haunted by the question of independence versus rebellion. I always felt that distinction very deeply. I was rebellious to be sure, and yet I didn't want to end up being automatically the opposite. In that sense it was important. I try to reject those parts of theories which

are unsuitable. I have never met a theory that is unsuitable, but always that parts of which are unsuitable; and by the same token, parts of which are suitable. You will find that I am not pro-psychoanalysis, and not against it. By that token I would strongly reject the suggestion that I am an eclectic. The problem then becomes, not to just accept the parts that are good, and reject the bad; but some systematic way of viewing the total situation so that we can fit in all the truths from each theory. This is what I am striving for. If I live long enough, which I doubt, this is what I would like to end up having. I think everything I do aims in this direction."

"I think my belief systems theory (cf. 1960) attempts to do this. There is a place in it for defense mechanisms, there is a place in it for self-actualization. The need to be right insofar as possible, to be wrong insofar as necessary. The need to be right pays tribute to the kinds of things Maslow is yelling about; the need to be wrong insofar as necessary, the kinds of things Freud was concerned with. That's what I mean, to find some way to systematically place them in relation to each other, that's what I am striving for. I have a long way to go." As we shall see, this is an expression of the point of view Rokeach has developed around his central, significant question as to the nature of human beliefs. In this manner the other theories that he deals with, and selects from, become sub-categories of his overall point of view, his idiosyncratic harmony.

"Let me say this about self-actualization. It's extremely important to me that I realize my abilities and potentials. I always felt surprised at each stage of my career, that I hadn't fully realized myself, that there is always something else, that each thing leads to the next. I always have this fear that I've shot my wad, and the fear that I will have nothing left to say for the rest of my life. And then it comes as an extremely pleasant surprise to discover that I grow; and rightly or wrongly, I continue to feel that each advance in my thinking contains the seeds for the next advance, and am now getting reasonably confident that this will continue as long as I have any need to self-actualize."

"The security needs that relate to my professional life, to my role as an adult, professional, scientific person, are satisfied. Or have been gratified greatly in my life. The security needs that come from personal life, are far more complicated. The kind of person I became, as a result of the kind of family situation I evolved from, would probably mean that I am basically a very insecure person. The work that we are talking about is one major source of that security. My family life is another. I think, though, that probably these security needs are too complicated and insatiable ever to be satisfied, either by work or home. But I do feel that it is necessary to say that insofar as work is concerned I am more fortunate than the vast majority of people I have ever met. In that self-actualization needs inherent in my work are more satisfied in my life than in most peoples.' This is a great source of happiness and gratification to me. I can tell when my SA needs are being satisfied when I work. When they are not, my general malaise tells me this. When something finally breaks the way I want it to, and I finally got it down

on paper the way it's in my head, it's a tremendous emotional experience. I know when I've got it, and when I haven't."

"Would I call myself self-actualized? As a fully functioning human being, probably not. There have been scars left on me by life. As far as an intellectual and psychologist is concerned I think yes. Self actualized in the sense that I don't think I could have realized some potential within me that I haven't or won't. I knew what I set out to do in psychology and I am doing it. In fact, I am sometimes pleasantly surprised to find that I am doing more than I ever reasonably expected. It's always been an ambition in my life to someday write a book, and to write one book was enough, a big enough ambition. I am pleasantly surprised to find that before I am 45 I have written two books. Which leads me to believe that I may even write a third. In that sense, self-actualized. Although it represents more than just a book with my name on it. It is all that it represents in terms of intellectual investment. I feel myself very lucky, one of the chosen few, who have been fortunate enough in life, unlike most, to have realized certain ambitions, those having to do with work. I feel very fortunate in this respect."

We have seen enough of Rokeach's character to understand that, irrespective of its other characteristics, his definition of creativity as shown in Chapter I is close to his own personality and method. In this he does not differ from many of the other subjects. And it is probably very natural in anyone who is at all introspective and self-conscious.

"Creative? Naturally I think I am creative. I say this not because I am immodest, which I may well be, but rather I think that most people in the intellectual field think of themselves as creative. I have learned long ago that what a person thinks about the level of his creativity has nothing to do with whether he is good. I know people who aspire to be creative need to think of themselves as being creative. So what I say about myself is not immodest, because I am talking about emotions and not fact; knowing full well that the decision, whether or not I am creative, lies finally in the eyes of the beholder, not in me. I do have the experience of creativity, yes. But I hasten to add that I also have known people who are not creative to have that experience too. And that experience is indistinguishable between creative thinking and noncreative thinking. I've known too many uncreative people who honestly think of themselves as creative, to think otherwise." This is an important point, and one that we shall have to take up later, in attempting to evaluate further the nature of the creative person and the creative process.

"Peak experiences. I think I know what they are, and I know I have had them in my personal life and in my professional life. I think that the really big peaks are not in my professional life. The professional ones are joyous, happy, gratifying—all kinds of superlatives—but I would never dream of calling them the real peak experiences. I reserve that term for my personal experience yes. Ecstasy, love, that's what I think of, and they are irrelevant to the discussion of work. In no way minimizing the gratification

of work. I can't imagine getting any ideas, intellectually, the biggest of Newton or Einstein, that would represent a peak experience—however nice it would be to get one. If you want to weaken that definition a little, then I have had many such experiences in my life. Either a moment of insights, an integrative link, a reconciliation of a contradiction, a breaking up of a bottleneck—lots of them. Not every day of the week, they are not that cheap to be had. But these less stringent peak experiences come to me, primarily as I write. When I have to put up or shut up. The biggest peaks (in this sense) probably come in the process of trying to communicate in the writing process to other human beings. They don't come when I've got it all in my head, because there's no way to really prove it to myself."

I asked him whether he ever experienced what I would call altruistic peaks, experiences stemming from something good happening in the world, with no direct relation to himself. "No, certainly not. The test ban was great, marvelous. But I had nothing to do with it. That's why I can't have a peak. I can't think that I contributed to it. If I contributed to it, then I have the elation. I think that this strong emotion we are talking about is for me, completely reserved, and I suspect for most people, in two areas, my personal and work lives."

"Once in a very great while I might have an experience approximating a peak listening to music, where I am suddenly transcended above myself. This doesn't happen too often, but it has happened, and I've marveled at it. But that's quickly dissipated. Nature? Hardly if at all. It takes something so grand, like Yosemite, and it quickly dissipates. And I think I know why. I have to participate, if I am not participating, rather than passively receiving it, I can't really experience it. There is almost something unclean about getting an experience of this order unless you work for it. That is for free. And that's what LSD and mescaline were for me. I felt unclean, guilty, to feel ecstasy with nothing to be ecstatic about, with no person to relate to there. It is like having an orgasm in a vacuum. It was an orgasm alright, but it was in a vacuum; and that's why it didn't appeal to me, to go back and seek those experiences again. I want to have orgasms with people, not in a vacuum."

One of the important common characteristics of all the subjects was the unanimous feeling that their life goals were being fulfilled; in most cases beyond their previous expectations. I think we shall find in the end that this might be one of the most important distinguishing criteria of the creative person.

"I don't think that most of the people you will ever meet will say truthfully that their life goals have been fulfilled, and I am not going to say so. I will say this, my life goals are fulfilled far more than I ever thought possible. Especially in relation to work. Personal life, I am too complicated a person ever to be able to say that, probably never. Life work, far more. If I had to do it over, I'd do it the same way, and I probably couldn't do it any better. I am one of the few people I know who feels that, because of my

professional work, I have been able to arrange my life according to my needs, very very well. Professional life especially. I think I work at just about the peak of my capacity, and if I had more emoluments I wouldn't be doing much more."

THE LONG SHADOW OF A PERSONALITY

"I think all the problems I have ever worked on, from the very first to the very last, have a single theme running through them; and I suspect that this theme is not very different from the theme running through many other psychologists' work. Why do people believe what they believe, and do what they do, and why do they resist changing? In one way or another, everything I have done is related to this question. But I guess my main focus in asking it was, 'What do you believe; and why do you believe what you believe; and why can't you believe something else; and how do you know that what you believe is the truth, and what somebody else believes is not the truth; what tells you this; and what are the implications of believing this way rather than that way?'"

I am fairly confident that the somewhat extended discussion of Rokeach's childhood, education and personality that preceded this section, makes very clear the characterological roots of this question, and why it is so central to all his work. It is, indeed, much like the extended shadow of his own personality into the area of scientific investigation.

The question we have just seen is the central one in his first book *The Open and Closed Mind* (1960). The book is the working out of solutions to various problems suggested by the over-all paradigmatic question.

"Related to the big question is another question, for a psychologist, 'How can I demonstrate this operationally?' Whatever I ask, it must be such that I am going to be able to do something about it, other than simply asking and answering questions. This is not philosophy."

"I ask a question. First it has to be important to me, personally, in some very deep way. If it's not, then I probably couldn't be interested in it. Second, I've got to think it's important for other people, for the reason it's important to me. Then I take it from there." How does he take it from there? Here we enter into consideration of the processes, no longer of what we called (Chapter 1) the posing of significant questions, but of formulating and solving sub-problems indicated by the general question. Rokeach's discussion of this process follows, to a great extent the outline of Chapter II, sections III, IV and V; and my exposition shall conform to this format. The first question, then, is where do the sub-problems come from?"

"The sub-problems I get from the way other people have formulated questions of this kind, and the kinds of things they have done about them. Here the research on the authoritarian personality is extremely important. [This being largely the work of Frankel-Brunswick and Sanford, two of his teachers at Berkeley.] There the paradigm

was fascism, which I hated too. But I hated something beyond fascism. I hated Orthodox Judaism, not necessarily equating the two hates, there are qualitative differences. I could never join the communist party, a related question, and I could never get myself committed to anything for fear that it would be my undoing. The sub-paradigms are, 'Look, you've made some progress on the kinds of questions I am interested in, but now let's rephrase them so they really represent my questions.' And this is the way I have been able to say certain things about what is limiting in the work on the authoritarian personality; at the same time what's good about it; and how I got from there to where I went. This is about the difference between general and specific manifestations of phenomena. I hate not only fascism, but anything that is going to enslave me. That's one kind of sub-question."

This passage alludes to what I consider one of the more creative sub-problems of his work. Namely the demonstration that the work on the authoritarian personality was limited to one specific content-matter, fascism; whereas what was more important was the structure of authoritarianism, irregardless of specific content. This is an important extension and revision of the earlier work, which places it in a wider context, and removes it from the ethnocentric bias it strongly manifests. The other sub-problems were less directly related to previous work of so similar a nature. They carried the initial question into many areas of psychology, following out the implications of the major theme.

"Other problems have to do with, 'What consequences?' Let's see, what I believe and why I believe it, these must have some effect on the way I think. That tells me I should be interested in thinking, problem-solving, creativity. Perception—do I see straight? What do I remember? I have done work of one kind or another, mostly on thinking; and most recently increasingly on learning. What is the relationship between what I believe and how, and how it affects the way I learn?"

"Now I have generalized the problem, depersonalized it, or tried to, and can talk about anything in psychology. I started off by asking a question that has to do with somebody trying to make me believe something; and I end up asking questions that are related to all of personality, attitude organization, and cognitive phenomena."

It seems to me that this is one of the important aspects of the creative working out of a paradigmatic question. The generalization of the problem to all areas of psychology, following all the implications of the paradigm so that it is able to serve as the cornerstone of a world-view, or a systematic way of viewing human personality. This involves both the processes, first of accommodation; second, of assimilation.

"The only information I gather before formulation is very general. I can't get up enough motivation to read idly. Most of my work in reading comes after formulating a problem; and then I concentrate on the material in that area. I proceed to inquire into the area and acquire information. I ask myself, do I know what is relevant to my problem? What have I seen, where do I go to become as knowledgeable as I have to become in order

to deal further with my problem? For the purpose of implementing my formulating. If I am working on prejudices I read, not the whole literature on prejudice, it's too big. I have to decide which parts of it are relevant. For the next chapter, on cognitive functioning, I am dealing with a new body of literature. For example, I'd known about Witkin for years, not too clearly. The real knowledge of Witkin and his work came in preparing that portion of my problem which was related to it. The reading took place in the context of each chapter as a separate topic. Each is a distinct sub-paradigm, they could have been published as 20 papers."

"The process of formulation is an endless one, not static. You don't just formulate a problem, collect data and write it up. The formulations are states prior to the research, and the proof of it is the research itself."

"I have got a problem. What has anybody else done on this problem? I find out. Often I find a confirmation, and cite it as such. Often not much help, or they are on the wrong track, or have ignored something, or they forgot something. Therefore, their answer is not satisfactory, either because it is incomplete or wrong, in my thinking. Either way, it calls for another study. For example, I have some notions about the nature of belief congruence. This was at first an intuitive hunch, that fitted in with my general theory about the organization of belief systems. And then within the general hunch, I had an artistic feeling—the ethnocentrism scale, a measure of intolerance; the opinionation scale—a measure of intolerance. It didn't feel right to have two measures of intolerance, defined in altogether different ways. One had to go, it was inelegant to have two. That led to the race versus belief research (cf. 1960). To find out whether we need two. That research is now the center of a controversy. The research is designed to answer a specific question that flows from certain properties that I think belief systems have. If a person has X belief system, it should have these consequences for the way he thinks. Let's design something that will test the way he thinks."

The question of experimental design is one of the more interesting ones in studying the creative process. It is my belief that one of the things that characterizes creative thinkers is their ability and interest in designing new research methods. That is due, partly at least, to the fact that they are asking questions not subsumed in the accepted conceptual and instrumental framework; and, therefore, are compelled to invent novel ways to test novel ideas. We have already seen that Simon made a major innovation in research, pioneering in the computer simulation of thought. Rokeach, too, can be said to have made methodological innovations. The first of these is related to his emphasis on the importance of structure rather than content. His "dogmatism scale" (1960) is one of the most creative tests around, because it emphasizes this important distinction, and allows one to grasp the essential similarity of seemingly disparate dogmatisms. While this is obvious to common sense, perhaps, it is a clear creative advance over the "F-scale," for one. The other major methodological innovation that Rokeach, to my mind, can be

credited with, is the work that resulted in his second book, *The Three Christs of Ypsilanti* (1964). Here, in the natural extension of his earlier work (he says this book could be chapter 21 of the first one), he went into the area of psychopathology to study the nature of belief systems. "What kind of a belief theory do you have," he asked, "if you can't explain the beliefs of crazy people?" In order to study the nature of insane beliefs, and their consequences, he took three mental patients who all thought they were Jesus Christ, and put them together for 2 years, during which time he studied their reactions to each other and the changes, if any, in their beliefs. It seems to me, without having searched the literature, that this is not only a creative idea, but also a novel one. It extends his investigation of the paradigm into a field in which such things are generally treated as qualitatively discontinuous with "normal" beliefs, and does so through the use of a very novel and interesting method.

"After writing, the hardest thing I do is designing a piece of research. If you want to know where I invest more of myself than any place else, it's in the design of research. Once the design is completed to my satisfaction, the rest could be done by any competent technician. And once the design is there, you can't lie about it. The formulation is proven by the design. I will spend endless hours on the design, and once I am satisfied, I leave it alone. I can spend three months designing a study, then one month to run it."

"What makes me do this rather than that? It's got to have a surprise element. It's got to have something that people won't believe unless they see the data. The more it has that quality, the more I am interested. And that guides my formulation and research design. It's got to have some element of difference of viewpoint. Otherwise I would be doing research to find out what I already know."

In his discussion of his productive processes, Rokeach reveals to a certain extent that he works out his problem in something of the manner Simon (1962) [*sic*] describes for the creative problem-solving he is interested in; just as we have seen Simon's work conforming to Rokeach's criteria of formulation of significant questions. In this sense, they each reveal in their work a fuller version of the creative process than they consider in their speculations about creativity.

"In any thinking I do, either relating my own work to a new area of research, or to somebody else's work, it is inevitable that there will first be the analysis, to discover the agreements, disagreements, contradictions (in which case I know I have something to do there), and then the synthesis."

"If I say that certain properties of belief systems are measurable by the Dogmatism scale, but they are also manifest in solving cognitive problems, then I want to build a cognitive problem so that certain actions with respect to it will reveal the same properties. And so the leap is done by the structural concepts. The structural concepts are my way of leaping. Isolation leads to agreeing with a particular statement on the dogmatism scale; isolation leads to a certain difficulty in solving the doodlebug problem. [A

problem that requires for its solution that the subject (1) discard three old ideas, relating to the nature of such problems, and replace them with 3 new ones (analysis); and (2) simultaneously integrates the 3 new ones into a new system (synthesis). This is another methodological innovation for studying the effects of cognition of dogmatism, a personality attribute.] I leap from scales to problem-solving, and draw a bridge that way. I think the reason why I am so interested in structure is precisely to have some concepts with which to leap, so that I can find something that a certain kind of communist has in common with a fascist, or a Catholic, or a Freudian. My preoccupation with structure and content, and the greater emphasis on structure, is precisely because I feel structure will help me leap farther, into disparate areas of human endeavor. There is also unification. Things previously thought of as unconnected, how lovely it would be to show that they are connected by the same properties, into some kind of coherent system. It is a search for order, the common structural principles that tie all kinds of disparate phenomena together in a similar explanatory system."

One of the aspects of clarification and communication that I have postulated as important is that of labelling. We have seen Simon's conscious appreciation of its function. Rokeach, too, is aware of this. "There are certain words that are distinctly mine, and were it not for my having used them, would be another thing. The word dogmatism didn't exist in the literature as it does now; belief system, while occasionally used, never had a place. When you see that phrase, it couldn't be anybody but me. Labelling is also for analogizing. I chose 'primitive' rather than 'non-controversial' beliefs, because I wanted a term similar to the notion of the primitive terms of an axiomatic system. In each case, I choose a word very carefully. The word 'dogmatism' was not 'rigidity', and I had to show why, and what the difference was. This is part of my tactics in dialectic, the clarification and distinction. My first step is to find every other word, which could conceivably be closely related, and try to distinguish it therefrom. And in the process of that kind of analytic activity, I achieve a great deal of clarification. Labelling serves a communicative function, a trademark function and an analogizing function. The word I pick has to satisfy everything that I might need from it. My method is to take a word that exists in the current language, and give it a technical meaning that clarifies it in some way."

The process of evaluation and validation is for Rokeach the experiment that tests the theory. After carrying out as many hypothetical "experiments in the head" as possible, the intuitive validation, the experiment is an official form of evaluation. "Here I regard myself in a somewhat special class in the sense that, not being considered an experimental psychologist, not an instrument psychologist, but dealing with concepts and issues that are traditionally very vague and fuzzy. I feel that I have succeeded as well, and perhaps better than anyone else, in dealing with these concepts in operational and quantifiable terms. I love the tenderminded problems, but I have succeeded in pursuing the line of work with tough-minded approaches, quantitative methods."

The communication process is one of the most important of the areas of scientific enterprise. Rokeach, conscious of this, is quite interested in the quality of his writing for the purpose of communication. "Each year, the style of writing, for some reason, becomes more important to me, for its own sake. It's really a test as to whether I really understand so that I can communicate without using a technical vocabulary. I have a need to communicate to people who are not psychologists, because the kind of problem I work on, I want to tell it to everybody, I have a need to tell what I do to everybody."

I think we have established that Rokeach can be considered creative by our definition (disregarding for now his influence on the formation of that definition). He has formulated a question that in its implications and generality deserves the designation of a significant problem; he has formulated and solved many of the problems indicated by the general question, and in doing so has made creative methodological innovations. Moreover, we have seen that, perhaps more than any of the other subjects there is a single unifying theme in his work that can be easily seen to relate to his background and personality. In conclusion, let us consider some of his views on his work as a whole and on the role of theory in psychology.

"I would not pretend that the kinds of theorizing I do is formal theory. I think I have a belief system, in that sense a formal theory; and I talk about its nature, its dimensions, its subdimensions. In that sense it's formal theory, but not hypothetical deductive. I think that at this stage in my intellectual life, the formality has a different role than it did ten years ago. There is no problem that I am able to work on now without knowing where it fits into the belief system conceptualization. And I am practically incapable of thinking outside of that framework. That's my trap, I am stuck with it. I am a captive of my system, and I continually try to find ways of escaping the lattice-work. I think so far I have managed to; whether I will continue to manage is hard to tell. I sometimes worry about it."

"I think it would be a crushing blow to my intellectual life, if the day came when I had to say to myself, all this line of thinking is a waste of time, let me start again as a behaviorist. I cannot conceive of what the evidence would look like, that would force me to reject my system, because of the very method by which I proceed. Do I have an open mind? This is what I strive for, this is what I am trying to become. This is my way of coming to grips with the question how to become open-minded? The fear of being close-minded about something horrifies me and haunts me."

We have here, also, the major grounds for possibly objecting to Rokeach's inclusion under his own definition of creativity. For it is his position that the really creative question arises out of abandoning a set of beliefs for a novel set which violates the old one. "We require the thinker to replace an old idea or system of ideas, which we objectively know he entertains, with new ones contradicting them, which we objectively know he did not previously entertain" (1962). Simon, in this sense, was forced by his perception

of discrepancy to abandon the rational model of decision-making that he had held. But Rokeach has made very clear that he never could bring himself to adopt anybody else's belief system. And, therefore, while his own belief system may be, culturally speaking, novel and significant, it did not really involve his replacing a previous system with this new one. We have, rather, a slow development, from early childhood, influenced by and reacting to other belief systems, never adopting them; and resulting in an original and novel one. On these, perhaps overly picayune points, Rokeach's definition would seem to exclude himself, even though, on a cultural level his work remains creative.

Herein lies, to my mind, one of the important advantages of the unitive definition that I have proposed (cf. above). This definition states that the creative process is characterized by "paradigmatic" formulation of significant questions, involving independence of judgment, which allows generation of novel belief systems which have significance for self and others. Rokeach fits in here without any difficulty, and I think that this is both more fair and more accurate. For if, as I do, we are to consider Rokeach a creative thinker, then we must do so irregardless of the fact that the significant question he has been preoccupied with stems from his personality and background. This is relevant to an investigation of the creative personality, but we should be able to judge the creative merit of his work without that information. Without it, we would have thought he fit his own definition; with it I, for one, must quibble on this point. The importance of the replacement of belief systems is great, but greater is that of an individual, original, and unique confrontation with reality that produces a significant question, and a novel view of the world. I think that Rokeach, on one level at least, is aware of this distinction. This comes out in his attitude toward his own work, if not in the work itself.

"I'd like to think that what I do is going to be lasting and built on a solid foundation. With the shifting sands, that foundation should stand. If nothing else, I've found out certain things about the relation of personality and cognition; even if the belief system theory dies a horrible death, the data showing the relationship I hope will prevail for a hundred years. The data are solid. My aim is more the advancement of knowledge than of theory. Findings are solid enough, but theories are too susceptible of being reformulated in radically different terms. That is good, it is the growth of science."

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