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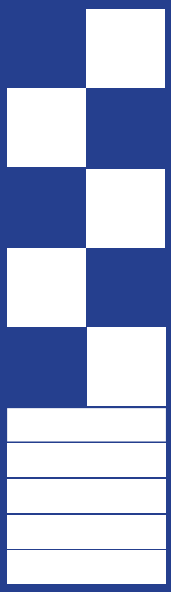
Creativity: Process and Personality

Larry Gross



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Larry Gross

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CREATIVITY

Process and Personality

A MEDIASTUDIES.PRESS PUBLIC DOMAIN EDITION

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Preface to the mediastudies.press edition

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Nearly sixty years ago, in the summer of 1963, I embarked on an ambitious project that would comprise my senior honors thesis in psychology at Brandeis University. I had entered Brandeis as a psychology major, drawn there by the presence of Abraham Maslow, whose work I had encountered in my father's library. As it turned out, Abe Maslow ended up being my adviser and mentor, until his untimely death at the age of 62, in 1970.

My primary interests as an undergraduate were psychology and art history, although I was also able to take advantage of the remarkable faculty then assembled at Brandeis across a wide range of fields. The psychology department, which Maslow had built and chaired for many years, was unusual for the period in not adhering to the then-dominant behaviorist school and I was exposed to theories of child development, personality, and perception, as well as the still controversial area of cognitive psychology.

Although it's tempting to merely direct readers unfamiliar with mid-twentieth century psychology to Wikipedia, I will note here one of the defining features of the behaviorist approach, initiated by John B. Watson and most influentially developed by B. F. Skinner. This approach insisted that the only elements that can appropriately be included in a scientific theory of human behavior are those that can be directly observed and measured. Anything else that might seem relevant to explaining human behavior, but that cannot be observed, such as thoughts or emotions, are excluded from psychological science, however welcome they might be in poetry, literature, and everyday conversation.

Abe Maslow's preferred approach, which he called Humanistic Psychology, diverged from both the behaviorist school that dominated academic psychology and the psychoanalytic approaches, Freudian and others, that dominated clinical psychology. Maslow's view of psychology was heavily influenced by Gestalt psychology, which postulated models of cognition, as well as cultural anthropology, which readily accommodated thought and emotion.

Behaviorist studies focused on basic processes of learning in animals and humans, which were seen as the direct result of the ways that actions by individual organisms (rats, pigeons, humans) were reinforced—rewarded or punished—by forces (social, physical, etc.) in their immediate environment. All learning and thus all human behavior, it was forcibly asserted, was determined by the same basic patterns of stimulus, response, reward, and punishment that could be observed in the behavior of rats or pigeons.

Psychoanalytic theories and methods concentrated on the diagnosis and treatment of mental and emo-

tional problems—with the challenge of repairing damage. In contrast to these approaches, Maslow emphasized the understanding of psychological health and creativity, and emphasized that a better understanding of human nature and possibility would arise from close study of creative, healthy individuals rather than from the more familiar practice of generalizing from the treatment of neurotic and even psychopathic patients. Maslow's (1954) first major book, *Motivation and Personality*, laid out the theory of a hierarchy of motives that shaped human behavior, and the possibility of "self-actualization" as the attainment possible for the happiest few.

It was typical of Maslow's approach to the field that he recruited Ulric (Dick) Neisser as a junior faculty member in the psychology department. One of my favorite teachers, Neisser was then developing the work that resulted in his important 1967 book, *Cognitive Psychology*. While it's probably difficult for readers today to appreciate that this title was itself a dramatic provocation at the time, the book represented an important move in the revolution that eventually overthrew the behaviorist hegemony that dominated psychology from the 1940s through the 1960s. Neisser's work in cognitive psychology drew in significant part from his early engagement with computers and computer simulations of human cognition, notably his collaboration with Oliver Selfridge at MIT in the 1950s.

When I began thinking about possible topics for an honors thesis, it seemed entirely appropriate to focus on the area of creativity, which was squarely within the domain of Maslow's work, but which also had deep connections with my other primary interest, in the arts and the role of the arts in shaping and reflecting culture. This also allowed me to draw on my extensive studies in art history, as well as anthropology and sociology.

Most of the studies of creativity that I was familiar with in psychology aimed at identifying and even measuring the mysterious trait—"creativity"—that somehow characterized those rare folks who made significant contributions to the arts. Some of these approaches were more democratic, in that they postulated a general trait of creativity that might manifest itself in almost any domain. Asking folks to come up with a list of things that could be done with bricks, for example, among other similar questions, would yield a cumulative score that would differentiate the more creative from the less imaginative and thus identify those possessing the "creativity trait." Somehow, this didn't seem to me to capture much of what I was interested in when I thought about the nature of creativity.

The direction I decided to take was influenced by Maslow's work, in which he derived an understanding of self-actualization by observing and talking to individuals, some of them his own mentors, such as Ruth Benedict and Max Wertheimer, whom he saw as representative of this rare tribe. I thought it would be optimal for me to embark on case studies of the creative processes as they were represented by a group of undeniably creative folks. It also seemed that if these folks were psychologists, and their creative endeavors constituted psychological research and theorizing, I would be better able to follow and understand their accounts than in the case, say, of mathematicians, physicists, or even painters or poets.[1]

Abe Maslow liked the idea and encouraged me to undertake an unusually ambitious project of deep-dive case studies of a diverse group of psychologists. With Abe's support I received an "Undergraduate Research Grant" from the National Institute of Mental Health (NIMH), through a program that was then new and I'm sure has been over for decades. The grant, which provided $300—nearly $2700 in today's terms—was sufficient for me to purchase a Wollensak reel-to-reel tape recorder that I used to record the interviews that are the basis of this work. This was a very new product—a portable (which is not the same things as light-weight) machine that could record on 30-minute reels, and that I could then use, laboriously, to transcribe the resulting interviews.

Recruiting an impressive set of willing research subjects turned out to be easier than I had any right to expect. Two of my subjects, Herbert Simon and Milton Rokeach, were known to my father, Bertram Gross,

himself an academic by this point. He knew Simon from the fields of organizational and management theories, and Rokeach had occupied the office next door to his at the Center for the Advanced Studies in the Behavioral Sciences in Palo Alto in 1961–1962. In addition to agreeing to be an interview subject himself, Abe drew on the nearby Harvard faculty and connected me with Jerome Bruner, David McClelland, and B. F. Skinner, all of whom agreed to participate.

Looking back over the thesis I see that I launched the project during the spring semester of my junior year, interviewing Herbert Simon in his office at what was then the Carnegie Institute of Technology (now Carnegie Mellon University) in Pittsburgh in April 1963. The interview with Simon, which lasted many hours, although only about four of them were taped, was then the basis on which I refined my interview protocol for the subsequent interviews, which lasted typically from three to four hours (except in the case of Skinner, which is explained in the text).

Once the interviews were complete, and transcribed—a laborious process for a two-finger typist, but one that allowed me to become thoroughly familiar with the material—I wrote the thesis during the spring semester of my senior year. I then departed for New York City and Columbia University, where I began graduate studies in the relatively new, and small, department of social psychology that had been created as a separate unit in order to escape the behaviorist orthodoxy that dominated Columbia's psychology department at that time.

My father brought the thesis to the attention of his editor at the Free Press, a storied publisher that had published the work of Weber, Parsons, Katz and Lazarsfeld, Merton, Goffman, and Becker, among others.[2] The editor was interested in the work—a tribute to the stellar cast of psychologists interviewed—and told me that he'd like to pursue the possibility of publishing it as a book. Quite a moment for a 21-year-old first-year graduate student. However, there was a problem. I had not originally considered the possibility that the thesis would result in such a publication and had not discussed this possibility with my interviewees; they most likely had not considered this, either, when they agreed to speak with a curious undergraduate.

I wrote to the interviewees and informed them of the interest expressed by the Free Press editor. Two of them were quite clear in refusing my request for permission to publish their interviews. Milton Rokeach replied that he had been much more candid in the interview than he would be willing to be in print—which was entirely fair. Skinner told me, quite reasonably, I thought, that he was planning to write his own memoirs and wished to reserve his recollections for his own writing. Subsequently, he published three volumes of autobiography. Abe Maslow was willing to have the interview published, with the exception of a few sentences about his mother. Bruner, McClelland, and Simon had no objections to publication, but without Rokeach and, in particular, Skinner—the "biggest name" at the time—the book idea evaporated.

In any case, I was fully occupied in other ways. I found myself in a new institution, in a new field—I had no previous exposure to social psychology and can clearly recall my consternation as classes began and I encountered names and theories that were entirely unfamiliar. In this new context the thesis and the topics it represented were far from my current focus, and I put the thesis away and largely forgot about it. Over the intervening decades I would occasionally show parts of it to interested colleagues or students, or recount the still somewhat surprising story of an unusually ambitious undergraduate thesis.

So, why am I taking this 60-year-old manuscript out and making it available to a possibly interested readership?[3] I am now older than all of my interviewees were when I interviewed them—they seemed so much older to me then!—and I have lived longer than Abe Maslow, who died at the ridiculous age of 62, and Milton Rokeach, who died at an also ridiculous 69. I am well aware that many of these scholars will be only faintly familiar to readers today, even though they were notable and eminent figures when I interviewed them. Curiously, B. F. Skinner, who was, as I've noted, arguably the most influential psychol-

ogist at the time, is now largely forgotten, while Abe Maslow, who was then seen by many mainstream psychologists as a fringe figure, is among the best known twentieth century psychologists. Herbert Simon is still renowned, given his lasting influence on decision theory and his 1978 Nobel Prize in economics. I believe it is fair to say that David McClelland and Milton Rokeach are less known to today's academics, and even Jerry Bruner, who died in 2016 at the age of 100 (!), is receding from view. This is, of course, the fate of most scholars, and says nothing invidious about these particular individuals. In the long run we are all dead, and most of us will be forgotten.

Reading through this work, it seems to have been written by someone else. I recall writing it, but the words and sentences are unfamiliar. However, I am also pleased and even impressed by the clarity and cogency of the writing, and relieved to see that it is interesting and engaging and even informative. This is, clearly, a testament to the interviewees and their generosity in speaking to me and being as candid as they were. It is also a reflection of the value of such interviews—oral histories, if you like—as a means to illuminate interesting and important aspects of the creative life.

Is there a theme that is common to these disparate scholars and their reflections—keeping in mind that they were all in the middle, not at the end of their creative careers? I think the closest summary I can find is that they emphasize the role of curiosity—pursuing hunches and allowing ideas to chart their own course—and serendipity—recognizing the value of the unexpected and being willing to change direction. They all note the degree to which they can retrospectively appreciate the unfolding of an underlying trajectory whose destination was not clear at the time. As I write this, in my 80th year, I am reminded above all of Kierkegaard's insight, "Life can only be understood backwards, but it must be lived forward."

Notes

1. I should note here that I was already thinking about symbolic processing—influenced by Hadamard's (1949) brilliant *An Essay on the Psychology of Invention in the Mathematical Field*—along the lines that I (Gross, 1973) later articulated as "[m]odes of communication and the acquisition of symbolic competence."
2. The Free Press had just been purchased by Macmillan and moved from its home in Glencoe, Illinois, to Manhattan.
3. I have chosen not to change anything in the thesis, besides correcting a few typos, and resisted the temptation to improve on my earlier self's writing or thinking. That would be impertinent and, quite possibly, unsuccessful.

Preface

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> If a Poincaré or an Einstein is willing to share his experience, why shouldn't a Bruner or a McClelland? It seems to me that it is with old-fashioned self-observation that the inquiry (of the creative process) should begin. (MacLeod, 1962, p. 183)

It was such a feeling that prompted the following study.[1] Deciding that the creative process was an area that was not as clear to me as I thought it should be, I began by looking at the work that had been done on this field, and l was impressed by one fact. Namely that most studies concentrated on the creative personality, as distinct from the process, and that they tended to be either very broad or even when they were detailed it was usually in a factor-analytical, statistical way. The common approach seemed to be to choose a sample and give them a battery of tests, and then to isolate the important variables of the creative personality, which turned out to be pretty common-sensical at that.

What I decided to attempt was firstly to find some ground between the broad and superficial and the sort of detail possible only in a type of study that was beyond my capability and resources. Secondly, I was interested in investigating the interrelations of the creative process and the creative personality, in the production of clearly identifiable creative products. And I decided to do this in the form of case-studies. To make it even more involved, I determined to choose psychologists who had produced products of recognized creative merit. This was so that I could feel reasonably acquainted and familiar with the nature of their products. As it happened, they were all psychologists with some definite views on the creative process, so I was attempting a creative study of psychologists involved in creative study of creativity.

After an initial pilot interview with Herbert Simon, I developed a tentative definition of the creative process (cf. Chapter I) based on the theories of two of the subjects in the research; and I prepared an outline of question-headings that would structure the interview (cf. Chapter III). The method I had decided to use was one of open-ended, extended interviews, structured only by this outline. In the course of the interview I tried to say as little as possible, and to have the subject interviewed determine the relevance and extent of any topic he chose to discuss. To this extent I tried to prevent my tentative conclusions from prejudicing my results, and I hope I succeeded.

My initial plans called for one or two such interviews and the preparation of case-studies on the personalities and creative processes of these subjects. But, as I realized that once having the outline l could interview a greater number of subjects, my aspirations grew. In the end I interviewed six psychologists, all of whom can be termed creative thinkers, at least to my satisfaction. The six were: Herbert A. Simon,

Abraham H. Maslow, Milton Rokeach, David C. McClelland, Jerome S. Bruner, and B. F. Skinner; and it is these six who are dealt with in the six case-studies that form the major part of this paper.

In presenting the case studies I have relied heavily on the data from the interviews, often presenting large sections verbatim. One reason for this is that, while of necessity I had to select only part of the accumulated data, I felt that any selection I did would impose my own views and criteria on material that had been given according to the criteria of my subjects. And that such imposition of my criteria was a bias, and the sort of bias that would be impossible for the reader to readily detect. Such is the limitation of the interview method. Therefore, where possible, I have let the subjects tell their own stories. In any case they tell it better than I could, and this only makes the paper more interesting to read, I hope.

l had no hypotheses in the usual sense of the word. Rather there were certain areas and attitudes that I was interested in and certain facts that I suspected might be there, and it was this sort of feeling that determined the nature of the outline. I did not include my tentative definition in the outline. The conclusions and definitions have played a larger role in the presentation, but here, too, I have structured the case studies according to the outline, which, besides giving them a degree of comparability, lessen, I hope, the biases of my own views. In presenting the data, it was necessary to make minor editing changes, to clarify some points, and to provide clear punctuation. In these, too, there is a risk of deforming the data. but I hope I have avoided it.

What is presented in this paper is, then, a group of case-studies dealing with the childhood and early experiences, the intellectual development, and the creative processes as well as various aspects of the personalities of six creative psychologists. All of which will be, I hope, interesting and informative. I, certainly, have learned from this study. In every instance I have found myself identifying with the subject and learning from his example about myself and about the nature of the processes I would like to be engaging in. I hope my readers will feel something of this same intellectual empathy.

Notes

1. [Though we have corrected typographical and other smaller compositional errors, we have otherwise preserved the original formatting, capitalization, and spelling throughout, with an occasional [*sic*] to indicate an uncorrected error that is potentially confusing. We have also updated the citation style to accord with the American Psychological Association (APA) 7th Edition, with references collected at the end of each chapter, rather than—as with the original—a collected, end-of-thesis References list—mediastudies.press].

Larry Gross

CREATIVITY

Process and Personality

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Chapter I: Definition: Creativity: Process, Personality

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In examining various definitions of the creative process, one is struck by certain assumptions that are common to most and by a basic disagreement which divides these definitions into two groups.[1]

The common assumptions are that products which are novel for a person or a culture and are considered valuable are "creative". The process that produces them is termed the "creative process" and is viewed as a distinct cognitive process, often involving distinct perceptual processes. A typical definition might be, then: "Creativity is that process which results in a novel work that is accepted as tenable or useful or satisfying by a group at some point in time" (Stein, 1963, p. 218).

Here, however, the agreement ends. The next step in some definitions is the proposition that creativity is a unique cognitive process, fundamentally different from all other forms of cognition, although it possesses certain similarities. Others propose instead that creativity is a special form of the cognitive process known as problem-solving, which, although it has certain distinct characteristics, is not essentially different from all other forms of "non-creative" problem-solving.

The first question that one must answer in order to proceed is whether these two positions are indeed, as they seem at first glance, irreconcilable. In order to resolve this we must discover if, in fact, they are describing the same process in the first place

The Dichotomy

The way I went about this was to find two theorists who had each formulated one of these positions, and see what they really meant. The formulations that I chose, although I certainly did not exhaust the possibilities, were those of Milton Rokeach (1962) and Herbert Simon (Newell, Shaw, & Simon, 1962). This is not exclusively Simon's work, but he holds, here and elsewhere, the views presented in the paper, and I consider him the clearest representative of this position. My next step was to compare the characteristics that each proposed as defining the creative process. These were as follows:

> *Proposition A*: The creative process is that sequence of thinking leading to ideas or products which, sooner or later, will be recognized as novel and worthwhile because (1) it is an activity characterized by the capacity to cognitively distinguish information from source and to evaluate them separately on their own merits which, in turn (2) frees the person to be receptive to, acquire, integrate, and transform new beliefs into new belief systems

> which violate previously held beliefs and belief systems, (3) all such activity being driven and guided from beginning to end by tension states arising from significant questions put to oneself, significance being cognized as that which has implications or consequences for the ideas, products. feelings, and welfare of other human beings (Rokeach, 1962).
>
> *Proposition B*: Problem-solving is called creative to the extent that one or more of the following conditions are satisfied:
>
> 1. The product of the thinking has novelty and value (either for the thinker or for his culture.)
> 2. The thinking is unconventional, in the sense that it requires modification or rejection of previously accepted ideas.
> 3. The thinking requires high motivation and persistence, taking place either over a considerable span of time (continuously or intermittently) or at high intensity.
> 4. The problem as initially posed was vague and ill-defined, so that part of the task was to formulate the problem itself (Newell, Shaw, & Simon, 1962, pp. 65–66).

A comparison of the above reveals that both theorists listed similar characteristics of the "creative process." Can we then conclude that, because of this similarity, the two propositions reflect nothing more than a superficial disagreement and believe an essential agreement? This is tempting, but presumptuous in light of the exact nature of these definitions and other statements made by these men. However, those very statements may offer a solution. Rokeach presents a specific objection to the approach taken by Simon:

> Where to look for this something "over and above" which characterizes the creative process and no other thought process? It is fruitless to look for an answer to this question from empirical research on problem solving or thinking or research on the computer simulation of thinking (Newell, Shaw, & Simon, 1958) because all such research contains a basic methodological flaw in respect to the study of the creative process. Such research always requires the subject (or the computer) to produce an answer but not a question. There is a division of labor; the researcher provides the question, the subject provides the answer. The researcher sometimes studies the subject to ascertain by what process he arrives at the answer. A full and complete description of this process, even if it were forthcoming, can never be a full and complete description of the creative process *because all creative work begins with a formulation, a question the creator necessarily puts to himself* (Rokeach, 1962, my italics).

Resolving the Dichotomy

This, I think, is the key to solving the dilemma of an apparent dichotomy. Rokeach here indicates that Simon is beginning by assuming the problem to be formulated and observing the process of arriving at a solution. His view, on the other hand, is that it is precisely the formulation that is the creative act (he quotes Einstein as saying that to ask a question is to answer it), and he assumes the eventual formulation of significant solutions.

In Simon's work with computer simulation of human behavior (which is the basis for his definition of creativity), he does, indeed, concentrate on the solution of an existing problem, although it is seen as "vague and ill-defined." He admits this weakness:

> If we wish to object seriously to calling the Logic Theorist [one of the computer programs] creative, we must rest our case on the way it gets the problems it tackles, and not on its activity in tackling them. . . Perhaps the real creativity lies in the problem-selection. This certainly is the point of the fourth characteristic we listed for creativity (Newell, Shaw, & Simon, 1962, p. 70).

Simon treats creativity primarily as "problem-solving activity characterized by the novelty and the difficulty of the task" (Newell, Shaw, & Simon, 1962, p. 115). I think we can say that the fourth characteristic he gives means breaking down or factoring, and thereby formulating more clearly in problem-solving terms, a larger goal or problem that was not necessarily set in these terms. The larger goal is what Rokeach

would consider a significant question. What, then, are the criteria which differentiate the significant from the insignificant?

> Creative work, starting with the search for a formulation and ending with a solution, is guided by beliefs, often implicit, unverbalized and unverbalizable, that one [*sic*] is doing is significant because he is extending, relating, interrelating, unifying simplifying [*sic*], making more elegant, more beautiful, reaching out to the genotypic reality behind the phenotypic appearance, groping for the structure, the form, the process, the function behind the content (Rokeach, 1962).

Rokeach is emphasizing the formulation of basic questions which have far-reaching implications and embody or relate to assumptions about the nature of reality that are axiomatic. These are the foundation blocks of a world-view, the fundamental axioms accepted without scientific proof, on faith.

In his definition of creativity Rokeach describes significance as "that which has implications or consequences for the ideas, products, feelings, and welfare of other human beings." The emphasis on the usefulness of the creative process in a social framework is characteristic of the psychology of Alfred Adler. For Adler the significance of creative production can only be measured in a social context.

> Genius is to be defined as no more than supreme usefulness: It is only when a man's life is recognized by others as having significance for them that we call him a genius. The meaning expressed in such a life will always be, "Life means—to contribute to the whole". We are not speaking here of professed motives. We are closing our ears to professions and looking at achievements (Adler, 1958, p. 9).

Simon deals with the formulation and solution of sub-problems that are implicit in the major question and are specifically solvable. The difference between the two approaches now seems to be that each one is pointing to a different part of the process as the creative process, and neither is really discussing the whole sequence.

Rokeach emphasizes the part that he considers essentially creative and unique, although it is an oversimplification to view the rest as a mere derivation from this first part. Simon, limited by his tool of computer simulation to what computers can do well at this point, leaves out the first part and studies the second, deeming it non-unique. What we must do is set the two definitions not in opposition but in succession, and view the creative process as a two part operation consisting, firstly, of the posing of significant questions, and secondly, of finding solutions for specific problems derived from the initial questions.

> In all creative works that I have ever done, what has come first is a problem, a puzzle involving discomfort. Then comes concentrated voluntary thought involving great effort. After this a period without conscious thought and finally a solution involving the complete plan of a book. This last stage is usually sudden (Bertrand Russell, quoted in Hutchinson, 1949, p. 112).

Generality of the Unitive Definition

Putting the two definitions together not only results in a superior unitive definition but also places the question of individual creativity in line with some important theories of intellectual evolution. Thomas Kuhn (1962) postulates a general pattern of scientific evolution applicable to all fields of science in all ages. He argues that "normal science" presupposes a conceptual and instrumental framework accepted without question by most of the scientific community. With such a given framework, scientific research tends to fall within the boundaries of existing significant questions, solving the specific problems they indicate rather than formulating new ones. Unexpected novelties can then occur only through a breakdown in the accepted rules. Inevitably the normal mode of scientific research evokes "crises" which cannot be resolved

within the pre-established framework. Science afterwards returns to normal only when the community accepts a new conceptual structure. That breakdown and the subsequent transition to a new base for professional research, a new "paradigm," is the process of scientific revolution. Famous paradigmatic revolutions are associated with Copernicus, Galileo, Newton, and Einstein. Kuhn also maintains that many smaller revolutions have complemented these larger ones, and that the revolutionary process is inherent in the nature of scientific advance.

This revolutionary process can be interpreted as the formulation of significant questions, arising out of new confrontations with reality, the world, etc., and resulting in new paradigms which in turn dictate specific problems to be solved. lt is possible to identify such revolutionary processes in any field of intellectual endeavor. In every area we can see recurrent breakdowns and restructurings, recenterings. In social science and economics we might name Darwin, Marx, Freud, and Keynes as the most obvious modem examples. ln art these take the form of stylistic innovations, and can be identified with movements, such as Impressionism, Surrealism, Cubism, etc., and with individuals, Giotto, Cezanne, Picasso, etc.

I would claim that this model of intellectual development and scientific evolution is directly applicable to the creative process. Moreover, I think that the creative process is a microcosmic example of the macroscopic process of intellectual evolution.

The first step dealt with by Rokeach is quite similar to the formulation of a paradigm. It is the formulation of questions which have implications basic to grasping the essential nature of whatever is being considered, what Wertheimer would call the main vectors of the problem situation. The second step is the process that Simon deals with, the solution of specific problems within the paradigmatic framework.

We should not limit our conception of the paradigmatic innovation and the formulation of significant questions to a revolutionary replacement of one system for another. It is also possible to identify paradigms which build in concentric form upon existing systems. In other words, such revolutions need not always start from essentials in all respects but may extend further the limits of existing frameworks.

We can, perhaps, view an individual's creative processes as a series of larger or smaller revolutions, revisions and extensions, and say that these will have correspondingly greater or lesser value for the person and his culture, sooner or later. The more limited the implications of the particular product, the sooner the recognition, I would say. This is because it will not threaten to a great extent the interests vested in the current paradigm. Not everyone who finds a new and revolutionary paradigm, or sees the fatal flaw in the accepted one, will be able to achieve recognition. Many do years of creative work, out of step with their times, only to be recognized after their death. They ask questions that cannot be answered yet, and answer questions that cannot yet be asked.

Independence and Uniqueness

Rokeach emphasizes the creative thinker's ability to distinguish information from its source and evaluate it on its own merits, and to generate novel belief systems which violate former ones. Not only are these the characteristics necessary to effect a revolution in science by recognizing faults in the present paradigm and formulating a new one; they are defining characteristics of a personality and even a cultural type (Hagen, 1962) known as independent or nonconforming. The analysis of creative thought as being opposed to conformity is based on these traits. The ability to form judgments in light of present situations, not relying blindly on the dictates of existing systems and authority, based solely on past situations; and the ability to make the next step and reject belief systems, forming new ones in light of empirical experience– these are characteristics of healthy or non-neurotic behavior (cf. Kubie, 1958; Maslow, 1954). Wertheimer, similarly, stresses the thinker's ability to center on the problem situation rather than on the self, "the main

vectors in genuine thought often do not refer to the I with its personal interests; rather they represent the structural requirements of the given situation" (1959, p. 180). Crutchfield makes the same point, in a way that illuminates Rokeach's suggestion of a continuum from conformity to independence to creativity:

> Conformity, involving loss of self-reliance, undermines the person's creative powers by weakening his trust in the essential validity of his own processes of thought and imagination... Conformity inhibits the person's ability to sense and grasp basic reality, and loss of this contact with reality is fatal to creative thinking. In short, conformity tends to destroy creativity by alienating the creator both from reliance on his own thought processes, and from contact with basic reality (1962, p. 120f).

Stressing the mutual exclusiveness of conformity and creativity brings out the distinction between the unique and non-unique aspects of the creative process. The first part is the exclusive trait of the small group who are self-confident and independent enough to be willing and able to discard a belief system and form a new one. There are many levels of belief systems, yet for most people operating within any one level, the only possible mode of perception (through choice, for safety, or for many other possible reasons) is one which is as oblivious to the existence of the basic belief assumptions as we are to the existence of air in the absence of a wind. It is the ability to perceive the air without a disturbing wind (sometimes even with a wind, for people learn to ignore the wind) that is the unique aspect of the creative process. One must be able, first, to see the handwriting on the wall, and, second, to interpret it, to understand that the existing system, which most people are not even aware of, is wanting and must be replaced.

Once we recognize the existence of the axiom and the fact that it cannot, by definition, be proven but must be accepted on faith, we are free to formulate other axioms which are more fruitful or satisfying. A belief system may become incompatible with experience, or it may have all its implications formulated and worked out. Either way a new one is needed.

Wertheimer's masterful case-study of the formulation of Einstein's theory of relativity is a good example of this process. Starting with a problem that intrigued him for many years, Einstein reached the point where he questioned the fundamental axioms of physics as they existed at that time and was forced to reject the prevailing belief system, classical Newtonian physics, in favor of a new one.

> He felt that a certain region in the structure of the whole situation was in reality not as clear to him as it should be, although it had hitherto been accepted without question by everyone, including himself (1959, p. 219)... In this troubled situation the question arose: Is this structure itself, in which the Michelson result seems contradictory, really clear to me? This was the revolutionary moment. Einstein felt that the contradiction should be viewed without prejudice, that the time-honored structure should be requestioned. Was this structure...adequate? (1959, p. 229)... This led to the decisive step—the introduction of the velocity of light as the invariant. How would physics look if recentered with this as a starting point? Bold consequences followed one after another, and a new structure of physics was the consequence (1959, p. 230)... Every step had to be taken against a very strong gestalt—the traditional structure of physics, which fitted an enormous number of facts, apparently so flawless, so clear that any local change was bound to meet with the resistance of the whole strong and well-articulated structure. This was probably the reason why it took so long a time—seven years—until the crucial advance was made (1959, p. 232)... [F]rom the moment, however, that he came to question the customary concept of time..., it took him only five weeks to write his paper on relativity (1959, p. 214).

The final working out of the new system is not unique, indeed, as Simon says, it is essentially the same as most problem-solving. Many of the implications of the revolutionary reformulations of Einstein were worked out by other, lesser thinkers. When this problem-solving isolates a sub-problem indicated by the paradigm and is able to generate the heuristics necessary to solve it, then it is likely to be novel and valuable and as such is termed creative.

One need not do both to be creative. The great men of science have frequently, but not always, combined the two. However, as Szilard says, "The most important step in getting a job done is the recognition of a

problem. Once I recognize a problem I usually can think of someone who can work it out better than I could." (Quoted by Rokeach.)

I think the most common pattern is reflected in the saying that a thinker will usually have only one really important idea. l would interpret this to mean that most thinkers, in the course of their intellectual lives, follow the implications and ramifications of one, more or less paradigmatic, significant question. Their work tends to be unified in essential structure, if not in actual content, around this central preoccupying question. While few are able, or lucky enough to ask a question which will create an intellectual revolution, I think most creative thinkers concentrate on one essential question or area in the majority of their creative efforts. This is something that will be supported to a great extent by the data to be presented in this paper.

Motivation and Personality

Simon describes creative problem-solving as characterized by high motivation and persistence. Rokeach stresses the tension generated by asking significant questions. But what motivates the person to ask the significant question in the first place, to initiate the confrontation with a problem-situation which transcends the limits of existing belief systems? One factor we can identify is the probable existence of high achievement motivation (McClelland, 1962), but this in itself is not enough to bring someone to question an entire gestalt, a traditional framework. In many ways, achievement is surer within the existing structure.

Maslow has described self-actualizing people as being more able than others to transcend their environment:

> They select from American culture what is good in it by their lights and reject what they think bad in it. In a work, they weigh it, and judge it (by their own inner criteria) and then make their own decisions (1954, p. 173).
>
> The point I wish to stress here is the detachment, the independence, the self-governing character of these individuals, the tendency to look within for the guiding values, and rules to live by (1962, p. 182).

Perhaps it is these people who are most likely to ask the questions which call into scrutiny the basic beliefs of their society, and who can also accept the good, the suitable aspects of that society without accepting the bad with it. Maslow speaks of a "self-actualizing creativeness" which need not be combined with the special talent that will produce a socially valuable product, but which fosters the very creative process of significant questioning we are dealing with.

> An essential aspect of SA creativeness was a special kind of perceptiveness that is exemplified by the child in the fable who saw that the king had no clothes on [and dared to say so, we might add] (this too contradicts the notion of creativity as products). Such people can see the fresh, the raw, the concrete, the ideographic, as well as the generic, the abstract, the rubricated, the categorized and the classified (1962, p. 129).

This is clearly a good depiction of the sort of personality we are concerned with, that is capable of the independence necessary to ask significant questions. I am not overlooking the matter of talent and ability, for although only those with great ability will ask questions of great, even revolutionary significance, and follow up the implications of their questions, we have already noted that there are many levels of operation, and it is possible to be creative, in this sense, on all of them.

Our definition of the creative process as beginning with a questioning of traditional beliefs not only brings us close to Maslow's discussion of self-actualized creativeness, it also brings out the distinction between creativity and neurosis. For, while we cannot deny that many neurotic, even insane, people have done creative work, there are two respects in which they will usually fall short of the standard we have set. The first is in their inability to respond flexibly to the requirements of the task-situation, tending to remain, rather, consistently self-centered, locked into repetitive patterns of reaction.

> The measure of health is flexibility, the freedom to learn from experience, the freedom to change with changing internal and external circumstances, to be influenced by reasonable arguments, exhortations, and the appeal to emotions; the freedom to respond appropriately to the stimulus of reward and punishment, and especially the freedom to cease when sated. The essence of normality is flexibility in all of these vital ways. The essence of illness is the freezing of behavior into unalterable and insatiable patterns (Kubie, 1959, p. 20f).

The neurotic individual is certainly capable of questioning, in certain circumstances, the accepted beliefs of his society. In fact, this may frequently be an important factor in his neurosis. Yet even here, his exclusively self-centered attitude prevents his questioning from taking in the task-centered orientation which might result in a valuable product. Adler, in stressing the differences between the creative and the neurotic, highlights the social interest inherent in true creativity.

> It is essential that we make a sharp distinction between reason which has general validity, and which consequently corresponds to the commonweal, the isolated personal intelligence of the neurotic... "Intelligence" we find in both cases, the failures and normal individuals, but we call reason only the intelligence which is connected with social interest: (in Ansbacher & Ansbacher, 1956, p. 150).
>
> In our view, a man of genius is primarily a man of supreme usefulness. If he is an artist he is useful to culture, giving distinctions and value by his work to the recreative life of many thousands. This value, where it is in genuine and not merely empty brilliance, depends upon a high degree of courage and social interest. The origin of genius lies neither in the inherited organism nor in the environmental influences, but in that third sphere on [*sic*] individual reaction, which includes the possibility of socially affirmative action (in Ansbacher & Ansbacher, 1956, p. 153).

One further point is necessary to fill out an attempt to describe the creative personality, and also to correct a possible misinterpretation of the element of social interest. Adler stresses the social interest of the creative thinker, yet we know also that creativity and altruism are not necessarily co-existent in all cases. Must we view all creative people as unselfish and altruistic? The answer here lies in the point made by Maslow (1962, p. 131) that self-actualizing creativeness transcends many of the commonly accepted dichotomies.

Creative people do not distinguish between work and play in the manner that is commonly accepted. For, in most cases, what they do when they are "working," is what they would most like to do, what they would consider "play." (Let us not confuse play and relaxation.) In the same fashion they are not necessarily being altruistic and unselfish when they devote themselves to socially valuable creative work. On the contrary, they are being selfish insofar as they are doing what most interests them. The dichotomy is clearly transcended, for they are being selfish and altruistic at the same time, and by the same actions. They are being true to others by being true to themselves. The genius need not be a saint; he may love mankind and despise his fellow men. The creative process he engages in affords him great pleasure, and its resulting products contribute to the social welfare. With this understood we can better accept Adler's statement that "Mankind only calls those individuals geniuses who have contributed much to the common welfare. We cannot imagine a genius who has left no advantage to mankind behind him" (Ansbacher & Ansbacher, 1946, p. 153).

Definition

Having proposed that the two definitions offered by Rokeach and Simon be combined into a unitive definition, and having considered the advantages and the generality of this unitive definition, I would like to formulate it in more precise form. This formulation will also take into account the third aspect dealt with here, namely that of the nature of the creative personality, of the person who is able and likely to engage in the creative processes we have postulated.

Axiom: Products which are novel and valuable (for a person or a culture) are produced by a "creative process" which includes the stages of:

Proposition A: "Paradigmatic" formulation of significant questions characterized by:

Hypotheses:

A1: Independence of judgment, which allows
A2: Generation of novel belief systems, which have
A3: Significance for self and others, and
A3a: Produce motivating tension, and often
A3b: Produce a sense of destiny:

(which are recognized by Rokeach and defined as unique cognitive processes) and also:

Proposition B: "Problem-solving" formulation and solution of significant sub-questions characterized by:

Hypotheses:

B1: Unconventionality of thought and heuristics, and
B2: Persistence and high intensity of work involving
B3: Difficulty in sub-question formulation:

(Which are recognized by Simon and defined as distinct but non-unique cognitive processes), and depend upon the presence of:

Proposition C: Motivational and personality factors characterized by:

Hypotheses:

C1: Psychological health (Kubie, Adler), and
C2: Self-actualization (Maslow), associated with
C3: Social interest (Adler), as well as
C4: Task-centering rather than self-centering (Wertheimer), and
C5: Strong achievement-motivation (McClelland).

Chapter II: Structure of Investigation

doi

Before proceeding with the actual case-study data, it seems to me that it would be suitable to explain the method by which the data was gathered. The interviews were structured through the use of an outline consisting of topic headings which was given to the subject, and which he was asked to respond to in a free, self-determined and open-ended manner. Each topic-heading was meant to suggest an area of potential interest, those which the subject felt to be relevant he would discuss. The outline also contained possible specific responses, but here, also, the suggestion was that the subject might indicate only those which he felt to be applicable. It was inevitable, in such an interview, that there would be over-lapping areas, but, by and large, the topics tended to remain discrete. Naturally not all of the subjects responded to all of the headings and not in the same detail. For one thing, due to external circumstances, the interviews varied in length from over 4 hours to 1 hour. For this reason, some of the interviews are more complete in one aspect, others in another aspect. On the whole, however, they cover the full range to a fair extent. The actual outline, as it was presented to the subjects (except in the case of Herbert Simon, that interview having been more of a pilot study), is as follows:

I. Social Environment

A. Family background. Family constellation. General family information. Religion. Family influences—personal, intellectual, professional. Feelings of apartness? Isolation? Difference? Persecution? Superiority?

B. Education—training. School—teachers, peers, influences. College—teachers, influences, changes of direction.

C. Teachers and Mentors. Related to intellectual development and specialization, choosing field, choosing problems. Restructuring, questioning. Learning specific things from specific people? Widening horizons? Acceptance of new ideas? Rejection of ideas? Conflicts with teachers? Collaboration?

D. Peers. "Invisible colleges", discussion groups, effects of peers on intellectual life. Widening horizons? Acceptance, rejection of ideas? Collaboration? Conferences? Seminars? Criticism, feedback? Support? Extension. Revision. Attack? Limitations?

E. Students. Teaching. Assistants. Carry out ideas? Contribute ideas? Expand? Refine? Criticize?

F. Organizational Context. University environment—as student, teacher. Cross-disciplinary influence? Isolation from reality? Ivory tower? Relations with official duties, administrators? Official pressures?

II. Motivation and Personality Factors

A. Achievement motivation? Conscious of n-ach? Sense of destiny? Crusader's zeal? Messianic fervor? Prophetic voice? Related to home background, schooling? Organizational pressures (publish or perish)?

B. Independence. Weighing of information. Accepting the suitable, rejecting the unsuitable? Deliberately, reluctantly, defiantly? Enjoyment of iconoclastic role (being right and different)?

C. Self-actualization. Are security needs satisfied? Love needs? Belonging? Power needs? When not? Would you call yourself self-actualized? Creativity—would you call yourself creative? Effortless? Tough?

D. Peak experiences? Related to what? When? Effects? Frequency? Nature? Ecstasy? Joy? Bliss? Enthusiasm? Excitement?

E. Life Goals. Fulfilled? Unfulfilled? Secret desires? 3 wishes? (Day-dreams?) What would you most like to be doing?

III. Preparation

A. Formulation of significant (paradigmatic?) questions? Goals? Sub-paradigms, sub-problems, sub-goals? Re-formulations?

B. Acquisition of information. Before formulation? After? Recall of information?

Gathering new information? Design, execution of surveys, experiments? New methods to gather information?

C. Information found. Answers found? Satisfactory? Why not? Reformulations in light of information?

IV. Production

A. Movement of information? Storage? Retrieval?

B. Analysis of information? Reduction? Factoring? Combination? Accept, reject, preview ideas? Theories? Heuristics? Models? Formulate sub-problems? Structure information in light of sub-problems?

C. Synthesis of information? Generation of novel ideas? Theories? Belief systems? Heuristics? Models? Combination, recombination of old and/or new ideas, theories, etc.? Structuring information in light of new systems? Formulating solutions? Labelling?

D. Evaluation, testing, validation. Intuitive? Rational? Logical? Experimental? Criticism? Feedback? Collaboration? Revision?

E. Definition of product. Elements of distinctness, uniqueness? Elements of similarity?

V. Communication-Distribution

A. Writing. Organizing for communication? Labelling? Relating to field? Discipline? Other disciplines?

B. Marketing. Articles? Books?

C. Feedback. Acceptance? Support? Confirmation? Extension? Rejection? Attack? Contradiction? Rewards? Social? Personal? Further work? Directly related? Influence of feedback?

Chapter III: Herbert A. Simon: How do People Make Decisions?

doi

The interview on which this case-study is based, differed in some aspects from the interviews which form the bases for the other case-studies presented in this paper. It took place on April 27, 1963, at the Carnegie Institute of Technology Graduate School of Industrial Administration in Pittsburgh. The actual interview lasted approximately 6 1/2 hours, of which 4 1/2 hours are recorded on tape. At that time the research project was in its planning stage and this first interview served as a pilot study. It was only after this interview that the outline-structure presented in Chapter II was developed, partly on the basis of this first experience. However, the structure of that interview was fairly similar to the later outline. The main difference was that, while the main headings were the same, there was more emphasis on the production of the specific products discussed and on the preparatory processes (especially education) than on the motivational and personality factors. For that reason the case-study that follows will be more detailed in some areas and practically blank in others. In many ways it is better than the others, mainly due to the time available and to the ability of the subject to recollect relevant details.

The subject in this interview was given an outline of questions and topic headings, which served the same function as the one given in Chapter II. This outline was 8 pages in length, and I will not reproduce it here. The questions were more specifically related to Simon's work than those in the later outline. This contributes to the lack of comparability. However, the headings were substantially the same: "Social environment (teachers, colleagues, students, clients); Personal background, motivation; Preparation; Production; Product characteristics; Judgment." The presentation will follow this general outline, and, insofar as feasible, the outline of the other studies as given in Chapter II.

Herbert Simon can certainly be termed a psychologist, although this would be far from an exclusive definition. Although currently a Professor of Psychology (in the Graduate School of Industrial Administration, Carnegie Institute of Technology), he never had so much as a single course in psychology. His formal training, as we shall see, was in political science and administration. He has been a Professor of administration and has made some of the most significant contributions to modern administrative theory. He has pioneered in the use of mathematical tools in the social sciences and particularly in the use of the computer as a tool for investigating human cognitive processes. He is one of the most prolific social scientists alive. He has written, alone or in collaboration, fourteen books, and approximately 200 articles. He might easily hold the record for distribution of publications in many fields. His books range from administrative theory to mathematical-psychological models to economic and fiscal theory. His articles have been published in administrative, economic, sociological, psychological, mathematical, engineering, political, and industrial journals. Yet Herbert Simon claims that all of his work has been essentially unified, and that there is a central theme which runs through all of his varied products, however disparate they may seem superficially. This theme may be termed as a preoccupation with one question, and with its many implications, namely: "How do people make decisions?"

Background—Childhood

Herbert Simon was born in 1915, in Milwaukee, Wisconsin. His father, an engineer, had emigrated from Germany. "My father had a younger sister, and no other siblings. He grew up on a farm in Germany and was sent away to be educated. His father thought he ought to be a banker, but he thought he ought to be an engineer, so he became an engineer. He came over here just after he finished his engineering work."

An important influence on the young boy was his maternal uncle, an economist. "My mother had a younger brother, he was 2 or 3 years younger than she. He didn't live in Milwaukee, but he would come home for vacations. He was the favorite uncle, who always brought presents. There was always a warm relation but not any intellectual contact. But he was then sort of a symbol—for my mother and my grandmother. (My mother, I am sure, had very ambivalent feelings toward him. I am sure that underneath there was a fair amount of hostility.) My grandmother lived with us off and on through most of my life till high school. My grandfather died about the time the uncle died, when I was very young. My uncle was the symbol of about all that was perfect to my grandmother. When I got Phi Beta Kappa, I inherited his Phi Beta Kappa key, which was something I knew I was going to do for ten or fifteen years."

"I had one brother who was five years older than I. I was sort of close to being an only child, although I had a good deal to do with him, we fought like cats and dogs. But I ran

after him, which maybe was the reason we fought." The question of sibling rivalry here is, I think, a relevant one. Simon's response to the question as to whether there was real sibling rivalry was quite positive, and it illuminated an important factor, I think, in the development of strong achievement motivation. He recalled an incident in point, taking place when he was quite young.

"My brother was and is a pretty bright guy, who had a terrible time in authority relations with my father. My father still was a German when he came over, was much milder by the time I was born. He and my brother had their problems, in the usual way, and I was sort of the fair-haired child. Which I am sure my brother resented, and if he didn't, I don't know why not. I never had a real feeling of competition with him, in any conscious sense, but I am sure I competed with him like the devil. And I am sure I made his school life miserable for him, so that he lost all ambitions in this direction. He finally went into law, but not through any love, any love he was willing to express, at least, of academic things. So he got the short end of the stick." (It is important in this case, as in others, to remember that we are dealing with subjective impressions from a biased source. This is one of the advantages as well as a disadvantage of this method. The value of this data, where it is better than dry vita data, is in the recollections of the adult and the choice of incidents and facts as well as impressions. In many ways this is more informative than the actual facts, which will not necessarily reveal anything of the individuality and uniqueness of each subject. Certainly as much, if not more, can be learned from the coincidence and divergence of opinion, as from the comparison of such facts as constellation and religion. One further point—we should, it seems to me, keep in mind the nature of the sample. These subjects are all academic psychologists, as well as creative thinkers. We must expect their values and opinions to be influenced by their professional affiliations. By this I mean that they will tend to over-emphasize the value of the academic and scientific professions over other, perhaps equally open to creative endeavor, professions.)

Back to sibling rivalry. "I recall one incident when my brother was doing some problem in algebra—four men plow five fields in two days and so on—and my father was helping him, which was pretty rare because my brother was pretty good at math. And I walked up and said 'Oh, I can do those.' And my father said something like 'I don't think you can, but if you think you can, and you can do them, I'll give you five bucks.' And so I worked and slaved, I didn't know a bit of algebra, and I didn't get anywhere. It's an example of brashness which I am sure was not the only one."

The question of religion is tied up with the subject of feelings of apartness that Simon felt as a boy. In this area he covered a number of factors, personal and social, which contributed to a general feeling of distinctness and individuality, which seems to have been fairly strong. This is one factor which is common to most of the subjects here and is probably one of the more important characteristics of their personality formation in

childhood.

I asked Simon whether he thought that as a child he felt apart from his peers. "Yeah, I think this would fit. First of all, anyone who is real smart feels excluded, that may be too strong a word, but feels different, separate. And I always had this feeling. Spent a lot of my time in intellectual pursuits of one sort or another. Outdoor pursuits of a less social variety, collecting insects. Though I did a good deal of camping and hiking. Some social isolation, though not a tremendous amount of real social isolation. I always managed to find friends who were intellectuals also, some are college professors now—two of my high school friends I can think of right offhand are. But still a kind of feeling that there was a good deal of differentness between people who liked intellectual things and other people. Secondly, always a consciousness of being Jewish. Even though my family was not religiously Jewish. Still a consciousness of being a minority group member who couldn't get up in church and say, 'I believe in Jesus Christ and all the saints.' Although in that community I was very close to a church group, a congregational church, which maybe emphasized the separateness. I grew up in a community where there were no Jewish families around. We were not connected with the Milwaukee Jewish community. It consisted simply of a consciousness, an unwillingness to reject the identity with the Jewish background."

To the question, "did you feel that you were persecuted because of your intelligence or your religion?" he answered: "I don't really think so. I was pretty successful academically. I usually got the kind of things I wanted, life wasn't always happy, but I don't recall any feelings of persecution. In fact, I can recall much more poignant feelings of persecution when somebody jumps on me in print than anything I remember from my childhood."

It is probable that these feelings were more a matter of subjective feelings than of overt manifestations, for he was clearly not a social isolate. "I recall, in junior high school, taking some kind of personality test that had an extroversion-introversion scale, and I scored way out on the end of the introversion scale. Which probably reflected some inner attitudes, because at the same time I was extremely active in high school organizations. There was the debating club, which I was president of at one time, the Hi-Y Club (nonsectarian religious organization), the science club... I was a campus politician... I was interested in political phenomena. A friend and I built a little political machine which we had fun with... We liked to participate in organizations like this, we liked to run them and found means of doing it. We were active enough in voluntary organizations—the active people who get elected to office because they will do something."

This liking for participating in groups has characterized Simon's professional life also. It is expressed in an ability and a liking for working in collaborative groups, and an interest in administrative affairs that characterizes much of his academic work.

One of the most interesting elements in the factor of apartness is a physical one. This, too, we shall find to be frequently important for our subjects, though none as unusual as this case, and may be quite readily interpreted in Adlerian terms, as far as they go.

"On the separateness, it's a curious thing, but I don't think it is irrelevant—from a very early age I was quite conscious of being color blind. This always seemed to me to be as much a matter of separateness as either my intellectual abilities or my Jewishness. I am sure I didn't phrase it that way then, but later on, I always thought that this had something to do with my intellectual development. If you were color blind, you had to be a nominalist, and if you were a Jew in a Christian society, you couldn't be ethnocentric. So, it always seemed to me that this was quite congruent with the unproblematic character of my positivism. The reason why positivism just seemed obviously right to me. Well, this may be a rationalization. But, from the time I was quite young, the fact that people would ask me, 'Well, how does it look to you?' was quite striking and I understood the fallacy of the question."

"One other thing. I was left-handed. The left-handedness was ambiguous enough so that they were able to get me to write with my right hand... As a result I am kind of ambidextrous."

Intellectual Development

Herbert Simon began to develop intellectual interests at a young age. These interests included both mathematical-physical and social scientific areas. And while the social sciences predominated after a while the mathematical interest was always very strong.

"In high school I always liked my math and science courses, well, I liked most things pretty well. But I liked math and sciences a good deal, sciences more than mathematics. Why didn't I go into the physical sciences? Because I had, among other reasons, an excellent high school physics teacher who made physics sound like the completed science. It wasn't that we didn't do things; we had a good lab, and we worked hard at it. But somehow or other it was classical physics, and you got the impression that all the exciting stuff had been done. I like excitement. So I think this had a good deal to do with it."

There was also an interest in games and game theory that has figured in much of his later work. "I played chess fairly seriously for a couple of years, kind of a passion, got interested in the theory of what was going on, and in that connection I wrote out the complete game tree for tic-tac-toe to persuade myself that the game is drawn if both players play correctly. It was a little more manageable than chess." (Simon is currently working on a program, among others, for chess.)

The influence in the direction of the social sciences came more from independent reading and family factors. "We had an old economic textbook around the house; I went through that pretty carefully. I went through William James pretty carefully. I had an uncle who was a student of John R. Commons, and although he died when I was 5 or 6, I suspect this made the idea of social sciences, economics, much more meaningful to me."

"My father was an engineer with a strong scientific bend. Very much interested in public affairs. During the depression, like most engineers, who are really technocrats at heart, he got interested in ways of dealing with the economy. He fell in with an engineer who had an economic theory, it doesn't sound quite so wild now, he had an hydraulic model of the economy, it sounded pretty wild then. But, again, the idea that you could deal with this thing as a system and make theory about it, I am sure rubbed off a bit. And I think it was some combination of exposure to the social sciences, more than most kids had, and I wanted to be a scientist, oh!, certainly from the time I was a junior in high school. But the idea that there was no reason why you couldn't do it right here in the social sciences, as well as the natural sciences, and that the bigger and more exciting problems were there. When I went to the University of Chicago I pretty much knew that I was going to be in the social sciences. I guess I started out to major in economics, and I worked within a mixture of economics and political science, which I think turned out well."

It was while taking a course in political science at Chicago that Simon chanced on a situation that provoked him to ask the question that he has been answering, in one way or another, ever since. This questioning resulted, eventually, in his doctoral dissertation, at the heart of which lies his most creative concept. The development of this concept is tied in with his entire professional life from the time he initially posed the question, so I think it would be best at this point to abandon the chronological sequence and discuss the nature of this concept.

Bounded Rationality

The product that I identified as Simon's most creative, which judgment he concurred with, is the development of the concept of "Bounded rationality" (Simon, 1957) and the demonstration of why this is crucial to organization and decision making theory.

Bounded rationality is a conceptualization about the nature of the relation of the organism to the world in general, which makes clear the necessity for specific processes such as "satisficing" in order for it to behave adaptively in the world. The concept of satisficing is a definition of the decision making process, which is derived from, and seen with the help of the general definition of cognitive processes as being characterized by bounded rationality (1947, introduction; 1957, Chaps. 14–17).

Bounded rationality was formulated as a contrast to, and qualification of, the mathematical-economic model of rational decision-making. This view of behavior may be summarized as postulating objective rationality as the criteria of choice. The implication must be that the behaving subject "molds all his behavior into an integrated pattern by (a) viewing the behavior alternatives prior to decision in panoramic fashion, (b) considering the whole complex of consequences that would follow on each choice, and (c) with

the system of values as criterion singling out one from the whole set of alternatives" (Simon, 194, p. 80). This one alternative, by this view, is the "optimal" or "maximizing" choice, i.e. the one that will yield the maximum positive consequences.

However, Simon objected, actual behavior is not described by this model. Not only is it an idealized model, it is misleading. Actual behavior falls short of this model in at least three ways.

> (1) Rationality requires a complete knowledge and anticipation of the consequences that will follow on each choice. In fact, knowledge of consequences is always fragmentary. (2) Since these consequences lie in the future, imagination must supply the lack of experienced feeling in attaching value to them. But values can be only imperfectly anticipated. (3) Rationality requires a choice among all possible behavior alternatives. In actual behavior, only a few of these alternatives ever come to mind (Simon, 1947, p. 81).

Simon's argument, presented in slightly more general terms, will be easily understandable to those familiar with the psychological theories of cognitive processes. It was much less acceptable at the time it was originally stated, in 1941, and in particular it was in opposition to the body of economic and administrative theory.

> It is impossible for the behavior of a single, isolated individual to reach any high degree of rationality. The number of alternatives he must explore is so great, the information he would need to evaluate them so vast that even an approximation to objective rationality is hard to conceive. Individual choice takes place in an environment of "givens"—premises that are accepted by the subject as bases for his choice; and behavior is adaptive only within the limits set by these "givens" (Simon, 1947, p. 79).

This is the essential conceptualization of bounded rationality; namely, that completely objective and rational behavior is not possible for human beings because of inherent perceptual and conceptual boundaries of their cognitive processes. From this general proposition he then derived descriptive hypotheses about the nature of decision making in organizations. The final formulation of these was that if we consider decision making the essence of administration, and Simon does, then the "central concern of administrative theory is with the boundary between the rational and the non-rational aspects of social behavior. Administrative theory is peculiarly the theory of intended and bounded rationality–of the behavior of human beings who satisfice because they have not the wits to maximize" (Simon, 197, p. xxiv).

The application of the principle of bounded rationality to organization theory allow us, then, to show that people do not find optimal solutions, but settle for satisfactory ones. This opposes "economic (maximizing) man" with "administrative (satisficing) man." Satisficing man perceives a limited number of alternatives, and he does very limited amounts of consequence probability computation. He sets his level of aspiration—which is determined by the alternatives he hopes to find, and modified by those he does encounter—and he chooses the first alternative that is above this threshold. Rarely does he consider more than a few alternatives at once, usually those he does consider are encountered sequentially, not panoramically, and the first satisfactory possibility is usually "it."

This conception of the nature of rational perception and the resulting nature of rational decision making was presented, in Simon's doctoral dissertation—later the book *Administrative Behavior* (1947), as a more adequate model of descriptions, and as a guide for improved administrative behavior. If one realizes the boundaries of one's rational abilities, one is able to perform better because one can make an accurate appraisal of means-ends relationships and of alternative strategies of action. If one is aware of one's limits, one can more realistically set one's aspiration level, and not waste time trying to maximize when this is impossible. There are many derivative implications from these principles, in fact, the book (1947) might be seen as a thorough application of these principles to formulating an administrative theory.

The concept of bounded rationality extends beyond the limits of administrative theory. It is a model of all rational cognition, and satisficing is a model of most decision making. Simon later used these concepts, for example, in developing a method for computer simulation of human behavior. By postulating a satisficing model he was able to arrive at heuristics for problem solving which did not need to consider the problems of optimal solutions and the processes which characterize them.

Paradigmatic Formulation

In order to trace the process by which Simon developed the concept of bounded rationality, and the influences in this process of various teachers and mentors, we must back-track to the year 1934, when Simon was nineteen.

"In 1934 I was taking a course with Jerry Kerwin in political science. As a term paper I decided to go up to Milwaukee and find out about the organization of recreational facilities up there. Kerwin was writing a book at that time on city governments and independent boards, and recreation was one of them, the Milwaukee system was an interesting set-up, so I guess he suggested that I go up there. I don't know whether I went up between terms or just took off one day, I didn't pay much attention to classes." The accidental nature of the decision to do this study is something we shall encounter in some of the other studies.

"So I wrote a long paper on the organization of recreational facilities in Milwaukee. Mostly it was just a description of how things were organized, and since I hadn't had any organizational theory or the like, I wrote as a journalist might. Someone just describing what he saw in front of his face, and what people told him. But, first of all, Kerwin said, 'Well, this is all very interesting, but why don't you draw any conclusions about how it ought to be organized?' And this kind of amazed me. How was I supposed to draw any conclusions? I had observed an organization, I could tell you how it operated, within limits, and what did this have to do with good, bad or indifferent operation. That comment amazed me. But even before he made it, one thing had struck me about

the organization more than anything else. The recreation activities were run by the school system, but were maintained by a group in the public works department and they got along fine, but they squabbled about the budget. The public works department always wanted to spend more on maintenance and the education department wanted to spend more for hiring recreation leaders. I thought, well, this needs some explaining. I probably tried to understand what went on in terms of what I had learned about decision making in economics, of course in those terms, it doesn't make a bit of sense (demonstrates this). Why is this? I think the kernel of the idea of bounded rationality came out of worrying about that."

The influence of the teacher, Kerwin, was not so much in directing him to perceive this particular question, but in a general push toward more analytical and evaluative observation, toward a more scientific attitude. And it was such an attitude which made it possible to ask the question which engendered his dissatisfaction with economic theories of decision making.

The problem of how people made decisions remained with him during the next few years, and was dealt within some of the courses he took, albeit in terms of the economic model. "I took a course from Clarence Ridley, on municipal measurement, and got interested in the problems of evaluating civil administration, we did the work that resulted in that monograph of ours, in 1936 I think (Ridley & Simon, 1938). And there again, I came up against the problem of how decisions are made, but there we were dealing with it normatively, and I worked within the framework of the economic model. . . Meanwhile I was taking courses in mathematics from Henry Schultz, and a fair amount of economics, and I was taking logic from Carnap. I hadn't had any formal psychology, although I had read William James."

In puzzling over the decision making that went on in administering the Milwaukee recreation facilities, Simon had realized that he had no analytic tools to study these processes. All he know of where the theories of rational decision making as described in economic-mathematical frameworks. But he realized, these did not describe what did actually occur, at best they showed what should occur, in the best of all possible municipalities. From here, we can see how he arrived at the idea that it was necessary either to stipulate that rational decision making was not characteristic of the behavior of the administrators in the Milwaukee recreational facilities, or that it was possibly not characteristic of administrative decision making in general. It was here that he decided to reject this model, and the conceptual framework it presupposed, and to formulate a new one. This corresponds to what we have termed independence of judgment, which allows one to distinguish information from source and to evaluate each on its own merits, in light of empirical experience; which allows one to discriminately select those parts of accepted frameworks which one will accept and those one will reject in the process of formulating significant questions. This was the first step in posing a significant, paradigmatic question, and in outlining significant, implication-laden solutions.

The idea of bounded rationality was clearly formulated in his doctoral dissertation, written in 1941–42. By that time he had already become acquainted with the work of Chester Barnard, his one real mentor. However, he does not report any strong influence on this formulation of any of his teachers at Chicago.

"The thesis was done under Leonard White, but I thought up the project, and I wrote it while I was out in Berkeley. I went out there before I had even started on my thesis in 1939, to head up some studies the Rockefeller Foundation was financing on measurement. And while I was out there I took my preliminaries, then I was writing my thesis while I was there. The Chicago department was fairly permissive, and had been terribly permissive under Merriam, but now White had taken over, but he couldn't remember who had taken what. All he knew about me, really, was that I was a guy who had been around the department when he came back, and people apparently spoke well enough of me so that I was kosher enough around the department. So when I proposed a thesis topic, that was all right with him. He later discovered that I hadn't had any graduate courses, and that disturbed him a bit, but he didn't know that till the day I came up for my orals."

"Political science, though Merriam and the department in the 30's had tried to make it so, has never been a science; it's a form of belles lettres. The notion of a thesis is that you write an essay about something, and it's very scholarly, and has lots of footnotes... So it wasn't particularly unusual that I should just pick a topic and start working. And so I did, and I submitted a draft and Leonard White read it, and Charner Perry in philosophy, and someone else, and they gave me some comments which were neither very broad nor very deep. White never claimed to understand it. As a matter of fact I always resented this. His attitude was always sort of, 'gee, well you are an awful bright guy, and if you wrote this it must be so, but I don't really understand it.' I guess I must have been known as someone who began to use mathematics in political science because there was a little bit of a hands off attitude: 'Gee, this guy is using mathematical tools, and we don't know what they are, but he must be right.' So the honest truth is that I hardly had any criticism on it—I made some minor changes, shipped it in, and they approved it."

If Simon does not give his teachers much credit for helping him develop the concept of bounded rationality, he clearly gives a great deal of credit to Chester Barnard, whose book *The Functions of the Executive* (1938) had a major influence on his ideas.

"I found in Barnard's book another way of looking at decision making, besides the economist's, that seemed to me to make sense, that seemed to begin to show me how to deal with this. And so, from the day I picked up Barnard's book, it seemed to me that he was pointing in the generally right direction, and that this was something I could build on."

Barnard pointed out "how little rationality people were capable of," anticipating Stone's intuition of this. But he did not use this idea as the basis for formulating a new paradigm. It was Simon who asked the paradigmatic question, "How do people make decisions?" and its sub-questions, "What are the limits of rationality, and how do people react to them?" (Here in the context of organizational theory.) However much Simon might owe Barnard, his work still has the nature of formulating a new paradigm, and involves the rejection of much accepted theory on the basis of empirical testing. He recentered administrative theory in stating that human beings are not capable of making decisions in the rational manner described by existing economic-mathematic theories, and showing that the central concern of administrative theory "is with the boundary between the rational and the non-rational aspects of human social behavior."

The rejection of a belief system, and the formulation of a new perspective within a new paradigmatic formulation is, then, an achievement of Simon in which he was assisted but not really preceded by Barnard. "I had the problem with the recreation thing, before I'd read Barnard. Also when I was working with Ridley on the measurement of municipal activities, and I thought a great deal about rational choice. So I don't even know to what extent I got these ideas from Barnard and to what extent I just found them terribly simpatico in Barnard and further developed than I'd gone–this is very vague."

In any case, once he became aware of Barnard's work, he went through the book very carefully, and he clearly considers Barnard his chief teacher in this area. He even organized "a little Sunday morning study group (at Berkeley) which went through Barnard line by line."

In 1945, while at the Illinois Institute of Technology, Simon prepared an extended version of the thesis, and sent it to a number of people, one of whom was Barnard. "I got a very long analysis from him, about a 15 to 20 page letter, in which he analyzed it very sympathetically, but in great detail." Barnard's help and advice was useful in the preparation of the thesis for publication, and he wrote a foreword to the book that resulted (1947).

I think that we can say the process described above fulfills the requirements of the Proposition A of our definition of the creative process (Chapter I). There is the formulation of significant, paradigmatic questions, involving independence of judgment, rejection of former belief systems, and generation of novel ones to replace them. The book was a very important one in the development of modern administrative science (Gross, 1964, Chap. 7). Furthermore, we have here the paradigm that will figure in all of Simon's successive work in many disciplines.

Before going on to discuss Simon's further work, it would be worthwhile to note some of his views which directly relate to the question of acceptance and rejection of belief systems.

"The terrible thing in the social sciences is the extent to which everybody feels they have to start over again from scratch, instead of building... It always seemed to me that there is Barnard, he said most of the things right, so you start from there and improve, clarify, etc. But you don't just hit him over the head for the sake of showing that you are smarter than he is. He was a very smart and original man." This is welcome, because it stresses that one can use independent judgment to accept and not only to reject received ideas. When a paradigm is adequate, Simon is saying, use it, don't destroy it just to show off, because it includes much that is valuable that you will not replace easily. Indeed, what one often discovers is that although one may have a novel insight, and want to generate a new paradigm, the novelty may be only personal (which doesn't make it less creative), and it is necessary to be careful about junking an old paradigm that might contain your idea, and much else besides. "It's sometimes appalling—I write something that I think is a new insight—and I got back and find it in Barnard." One should have the courage and perception to reject inadequate theories and ideas, but also the integrity and thoroughness to recognize the value of existing theories.

> The independent person is often highly conventional in those ways of social behavior that facilitate life in the group and yet do not impede his own aims. The truly independent person—in whom creative thinking is at its best—is someone who can accept society without rejecting himself (Crutchfield, 1962, p. 139).

Productive Thinking

We have already seen that Simon proceeded to generate, with Barnard's help in pointing the way, a new paradigmatic system for conceptualizing perception in general, rationality in particular, and decision making in specific. What can we say about the nature of the thinking in this process we are terming creative?

The process of arriving at such a new system is one, I think, in which one is able to first suspend one's demand for tight structure and search freely and intuitively for a solution to the significant question posed. And, second, to re-structure around, or deriving from, the solution that one finds. By then testing the new structure we are testing the solution. This is consistent with the theories of Wertheimer (1959), Rokeach (1962), and Maslow (1954) among many.

Simon makes clear his recognition of the value of the unstructured part of this process. "One thing that differentiates people—the stronger your need to have one tight consistent framework, all the time, the more you are driven to limiting yourself to dealing with small problems where a framework will hold for a while. And the more you are driven to dealing with the large hairy problems, the more you tolerate some ambiguity and oscillation in framework. So it's no mystery that people who write about organizational theory and motivation or personality can be shown to, if not contradict themselves, at least to frequently talk this way, that way and the other way; whereas people who are willing to stick to something quite precise often read much more consistently. My at-

titude has been that you don't withdraw to the safe, do-able problems. You played a kind of mixed strategy. So you ought to be able to move back and forth between messy things and neat tight things. And you ought to use what you learn with messy ones to handle and build tools for when you retreat to tighter ones, and use them to go back and do a little better with messy ones... I do have strong urges to be consistent, to find a framework that covers things, but I realize I am just going to fall a long way short of that if I study the kinds of problems I want to study."

One of the characteristics of generation of new belief systems is a difficulty in finding ways to symbolize, represent and communicate them clearly. One may have a feeling of what one has formulated, but representation is still a problem.

"I was trying to verbalize why this notion of bounded rationality, of limits of rationality, was so crucial to the construction of administrative theory, and I was having just very great difficulty finding the right words for this, and I still do." One of the methods he used was that of mathematical models, a method he finds frequently of great value. "The model I was using at that time was a model of a formal proof in logic... even to the extent where there is a vague picture in my head of a proof when I think about decision making premises." He also used an analogy, which "popped" into his head. The analogy was that if you look at a glass bowl of molasses, all you learn about is the shape of the bowl; only if you can see the molasses being poured in, and see how it achieves an equilibrium, will you learn about the properties of the molasses. Once it has settled there is no room for theory.

He described his thinking in general in terms which are relevant here. "It seems pretty clear to me that I don't much use words in the usual sense in my thinking. I use schemes which are more abstract and more like mathematical structures in a lot of my thinking. Particularly when I am trying to get at the real framework—what the real guts of the thing are... I think in the mathematics and then translate it into English... The idea started out, in that recreational case, with a kind of a representation of decision making."

Another method, which is most important in the communicating process, is that of finding a good label for a new concept. Simon is aware of this method. "The term satisficing is a quite deliberate invention, which dates probably to 1955; I made it up on a Sunday morning, about the beginning of 1955, and the reason was the observation that it was just terribly difficult to communicate abstract ideas to people, to get them to focus their attention on them unless you labelled them appropriately. Something I had not been very conscious of when I wrote *Administrative Behavior*, not until the middle 50's. When you file information away, you file it in relation to whatever index of objects you have, and I had been kind of frustrated in trying to communicate about bounded rationality and its centrality in talking about administrative behavior theory. And it occurred to me that it wasn't going to get communicated until people had a piece to file this away, and bounded rationality didn't have the right umph."

In what way did Simon think these new belief assumptions were helpful in answering the paradigmatic question? "A belief that a framework like this one comes fairly close to giving one boxes to put things in at least." Such a belief gives one a "feeling that in this world, the really big pay-offs almost always come from restructuring situations."

Elaborations and Extensions

"I had always thought of *Administrative Behavior* as being a blank check that I had signed. I had said, here is the way we ought to conceptualize this, now let's see if we can use this to go out and do some research. And I guess one of my main driving motives ever since has been to pay off that check which has been filled in for a rather large amount."

Simon was motivated, we can say, by the sort of tension Rokeach was describing. He also defines this drive in terms which illustrate the idea of the paradigm as the assumed, but not continually re-established conceptual and instrumental framework, that presents a range of problems, and some heuristics for their solution. "Bounded rationality and satisficing are residual categories or models or warnings—all they do is give you a hunting license to now go out and find out empirically—how do people structure decision making processes in those situations where they cannot optimize?"

The major step in this process of filling out the implications of the paradigm (Proposition B) was one which generated a new paradigm, this time a methodological paradigm. This is something we will encounter again. The attempt to work out a conceptual paradigm often results in the production of new paradigmatic methods, in itself a significant creative achievement. In this case the methodological innovation was the development of computer simulation of human decision making processes. This was, in a sense, a concentric paradigm, building on the first one, and extending it into a new field, with immense potentialities. This step deserve the paradigmatic label for its social value if nothing else. There is good logic in the fact that Simon listed as the second of his most creative products, "in terms of the consequences they had for whole bodies of knowledge," the discovery of "how to use a computer to simulate these processes."

Simon was certainly aware of the value of this methodological innovation, for his work in particular. "I know how tough it was to get from a conceptualization like this to a concrete verifiable, objective description of the decision making process. And I still believed that was the thing to be done, but I was well aware of what the difficulties were and how inadequate our tools were. And a part of the effort I put into learning some math was to see if I couldn't find better formalism. My work for the Cowles Commission I regarded as an exercise in developing language and technique for handling these kinds of things. I never felt I had a good language for this till Al Newell and I got the gleam of using the computer. So I regard December 15, 1955, the day we got the first hand-simulated proofs, as the beginning of a new era."

The use of the computer has wide implications for the understanding of human cognitive processes. The ability to simulate human decision making, Simon saw as fundamental for simulating all human cognition. For Simon, "all cognition can be described as decision making."

"One of the things I have always been aware of, since I was an undergraduate, was the ease with which people could concoct plausible and even empirically verifiable little tiny micro-theories of behavior—all of which was sort of true in their time and place, but no one of which, obviously, was a whole theory, and nobody had any way of putting these together. So one of the things I have always been very conscious of is that fact that until we get technical means that allow us to deal with the simultaneous interactions of this complexity, we are going to have darn poor social sciences. Computers allow you to take these darn pieces, and start shoving them in one by one, which is all we can say a human being should be expected to do—and then find out what happens when they interact in a way that was never possible before!"

Ever since then Simon has been largely occupied with the use of computer simulation to understand human behavior with the assumption that as you can make a computer simulate a process that a human being goes through, and as it is possible to describe exactly what the computer is doing, then that description can be termed a theory of human behavior of creativity (discussed in Chapter I above).

The work with computers has been, as has much of Simon's work, largely collaborative. The original realization of the possibility of using computers arose out of discussions with Alan Newell of the RAND Corporation. "I didn't really think of computers as a tool for research until Newell and I got talking about the beginning of 1955. I was out at RAND in '54, and while I was there we were trying to make sense out of this data from the Systems Research Lab, and my way of making sense was to see if we could construct what I would not call a program of the decision making process. Newell and I tried to do it by hand, and failed. We couldn't get to the necessary level of detail. About that time we drove out to an air base, to see some air exercises, and while driving we talked about human problem solving, talked very vaguely about the possibility that one could really set down and formalize this process—that was probably in 1954—but we weren't specific." It was sometime later that they hit on the idea of computer simulation.

Simon has collaborated, to a greater or lesser extent, for many years. This is both specific collaboration, as in the writing of a paper or book, and general interpersonal stimulation and fertilization. But the collaborators have been relatively few, most of his collaborations have been with one or more of a small group of colleagues, in particular Alan Newell, J. C. Shaw, Harold Guetzkow, and James March. He feels that "Collaboration is not an easy business," and that it only works with "really smart and tough people." It must be symmetrical, not a teaching relationship. He values teaching as a way to clarify ideas, but not in a collaborative context. "It doesn't work if I have to pull

punches." One has to know when to criticize something, and also, "there were certain things, which, if you labelled them as half-thoughts, were not subject to severe criticism." Collaboration also fills another function, besides mutual feed-back. "You have extra ideas, in a university you can put them out into the environment and someone will take them up. Those that don't get taken up, you try and provide a home for."

But, while much of his work has been collaborative, in particular the work on computer simulation, all of Simon's work is based on the fundamental paradigm of bounded rationality and satisficing as conceptualizations of human cognition and decision making, a formulation that is clearly identifiable as his innovation. In this sense, he collaborates within his framework on the working out of various implications of the paradigmatic question that he originally formulated: how do people make decisions?

Motivation and Personality

Simon would certainly seem to be strongly achievement motivated, and this observation is borne out by his statements, as well as by his prolific productivity. He is conscious of a sense of destiny, as should be clear from his feeling that computer simulation heralded a "new era."

"When I was a kid I resented Columbus considerably for making a great discovery that I could not make." He always had an urge "to do something new, discover something." We have already noted that he lost interest in physics because it sounded "as though all the exciting problems had been solved... It was too crowded a country—too much exploration already done." There was more to it than the aspect of public appreciation, although he admits, "I have a pretty strong glory motive." It was also a love of discovering things, because they were there. "As a child, and still today, I just love to solve puzzles, if you want to put it that way, learning things, exploring things... I don't like to admit anything is impossible for me. There is an awful lot of drive here to prove I can do real hard things, a form of vanity I guess... Of course, I climb mountains for the same reason. If I start up a mountain it's very hard not to go to the top—and I hate every step of the way down."

The element of social interest is not lacking. It is manifested in the sense of destiny, the feeling that his work is opening new paths for human knowledge, "discovering the great laws of nature." This is one of the reasons for his prolific writing, and widespread distribution, although he hates writing. There is a "Missionary sense... I want to get people to use these ideas." Does he have a crusader's zeal? "Oh sure, sure I do."

Combined with the sense of destiny is a clear enjoyment of the iconoclastic role. "Satisfaction out of being right and different—being right about a judgment the world doesn't share. I am sure that kind of satisfaction is pretty strong with me."

Simon is predicting, prophetically, that cognitive processes are of a certain nature. He is basing his statements upon the two interconnected paradigmatic formulations that we have seen, and excluding from consideration, quite consciously, other factors and possibilities. He is confident, "I am placing my bets there," but he is also aware of the nature of this confidence. "Science gets done if there are a few opposing leads, and a few people who believe passionately enough in each one so that both get done."

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 though 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 though 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."

Chapter V: Abraham H. Maslow: The Mystery of Health

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This case-study occupies, of necessity, an unusual position in the research I am reporting. The reason for this is that the subject of the study is also the sponsor and advisor for the research. Moreover, my general psychological viewpoint and conceptions of creativity and the creative personality have been strongly influenced and greatly stimulated by contact with Abraham Maslow as advisor, teacher and writer. While I think it is accurate to say that the outline which guided the interview was my work, as was the definition of creativity I am using as a *vade mecum*, his influence certainly extends to these as well. However, it is my belief that this did not create any real difficulties in preparing the case-study.

The interview used for this study took place in two parts. The first, on August 8, 1963, lasted two hours and dealt with sections I and II of the outline (cf. Chapter II); the second, on October 11, 1963, also 2 hours, dealt with sections III, IV and V. In the preparation of this study I am using, besides the recorded interviews, information from writings and other personal communications.

Abraham Maslow occupies an unusual position in contemporary psychology. He is one of the two subjects, the other being Skinner, who are commonly regarded as representing a school of thought, a commitment to a comprehensive theory of human nature. In this respect the others are all more eclectic, or committed to more limited, specific areas of psychological inquiry; even though, as Simon for example, they may present fairly comprehensive theories. Maslow and Skinner, however, come closest to formulating systematic views of human nature as a whole, albeit from radically different, even opposite, positions.

But Maslow is unusual in this too. He represents a position that is a result of a synthesis, in its basic assumptions, of psychoanalytic thought, gestalt-organismic theory and much experimental knowledge, and utilizes a great many of the culture and personality

insights first formulated by anthropology. The resultant approach, which he has termed holistic-dynamic (1954), in true holistic manner goes beyond the sum of its parts. He has carried this view, to a greater extent than ever before, into the largely uncharted and mysterious realms of psychological health and human fullness of being. This exploratory venture utilizes the beach-heads of previous thinkers and the intuitive maps of artists, poets and mystics. In recognizing, bringing together, and building on the common interests of many seemingly disparate schools, theories, and thinkers, he has outlined the aims and methods of a "Third Force" in modern psychology (1962a, p. vi). It is this synthetic, integrated position that he has come to represent, a commitment to a theory of "Humanistic Psychology." The paradigm we shall trace, then, is more of a bringing together, and expanding upon, than a replacement of other paradigmatic view points.

Schizophrenogenic Environment

Abraham Maslow was born in 1908, and grew up in New York City. His recollections of his childhood differ from the other subjects in that their predominant tone is one of unhappy experiences, largely discontinuous with his adult life in tone and nature. He is the only one of the subjects who is an oldest sibling, which may be related to the unhappiness he reports. "Because of my troubles my younger siblings got along better." (In this context we might recall Simon's comment that his older brother had a "terrible time" with his father, who was "milder by the time I came along.")

One item of the outline around which many of Maslow's recollections centered was that of apartness, isolation, aloneness. This seems to be a dominant factor in his childhood. It is related to religion, to his family environment, and to physical factors. His general impression of his feeling at that time is one of almost total isolation and a sense of inferiority, extending even to his intellectual abilities, in a curious way.

"I think it is important being Jewish, especially in my generation. For me it definitely meant exile from the society. I was on the outside looking in, especially since I never lived in fully Jewish neighborhoods. In one I remember there was a little enclave of Jewish families, surrounded by Italians and Irish, so that going out of that area, going to the library for instance, meant going through the Irish neighborhood. And there was guerrilla warfare, you had to sneak and hide and run and so on. Going in the other direction was Italian territory. I got ganged often enough, and grew up thinking of Irish and Italians, Christians in general, Churches, religions, as a child, as cruel and nasty. So religion to me meant that you're nasty, or cruel, or a hater, or crazy."

"This feeling of being an outsider was double so, because I had a very unhappy home. I loathed my mother. She was a horrible woman and still is. My father fled the whole darn family; he was a nice guy but he just wasn't there. As far back as I can remember,

even at the age of five or six, I lived in the library. I can remember going to school an hour early and waiting for the teacher, and she would let me in, and I would sit there reading books—the primers. I lived in a world of books, not of people. School was beloved if I had a nice teacher, but hated when, as most often, they were not nice. I was persecuted in the style that Torrance describes, or Getzels and Jackson (1962). Occasionally, though, there was somebody very protective and nice."

"I hated home so much that I didn't even eat there. I lost my appetite when I came home. Later on, in high school, I was away all the time. I used to live in the 42nd St. Library Saturday and Sunday. I tried to leave home before breakfast, so I wouldn't have to see my mother. And then just lived for years without food, 15¢ for lunch or something. That was a very miserable family. I had fights with my younger siblings."

"My mother was a very superstitious, religious woman. To me as a child it was all the same. And I learnt from her, certainly, to despise everything about it. My father was culturally Jewish, but not religious. Because of this kind of background, it's easier for me to be aware of phoniness and dishonesty than for most people. Like you're not so committed to the phoniness, you don't accept it, as the fish accepts the water, it's like a strange thing. I can't look at television, for instance, I just can't stand the crap. It just enrages me."

"I later became friends with my father. He finally divorced my mother, and then we lived together. He was a very nice fellow, we were friends until he died. I left home when I was in college and never returned. I haven't seen my mother for 25 years."

"Oh yes, I was all alone in the world. Apartness, yes; difference, yes. Even my superiorities, my intelligence, for instance, I thought something was wrong with me. I felt different and this made for feelings of inferiority. The fact that I liked to read books I kept a secret or hid, and always envied the all-American boys. Persecution, yes. Both as a Jew, and as a timid boy, who wouldn't and didn't fight. I was a very ugly child and youngster. In high school and college, I was 6 feet tall and weighed 112 lbs. I felt peculiar; this was really in my blood, a very profound feeling that somehow I was wrong. Never any feelings that I was superior that I can remember. Just one big aching inferiority complex."

He only had one real friend as a child, his cousin Will Maslow. They spent a lot of time together, and eventually went to high school together. In high school, while a good student, the feelings of inferiority still remained, although the teachers treated him generally better than before. The reason for this may have been an intelligence test, in which he scored very high, which may have been known to his teachers, although he only found out years later. One example of this feeling that he cites occurred when an examination was announced for a complete scholarship at Cornell. His cousin Will took the test, scored highest in the state, and went to Cornell. But, he recalls, "it never would have occurred to me that I should take it. Me? But I was as good as Will! I could have

spent four years at Cornell. But I never would have dared take the examination."

He did participate to some extent in social activities, although of an intellectual sort. He was editor of a science magazine. In this context he recalls that in one issue of the magazine he wrote an article on the possibilities of generating atomic energy. He was hypothesizing on this possible source of energy and its applications. One of the uses that occurred to him was that of a submarine that would be able, with atomic energy, to stay submerged for long periods and travel at great speeds. This was in 1924!

After high school he went through college in a scattered sort of way. He went to the Cornell Agricultural College for a semester, which was free, to be near his cousin Will. He returned to New York, partly because Cornell didn't work out (hardly the right college to be in), and partly to be near his cousin Bertha, whom he later married. His wife, whom we shall mention further below, was to become the center of his emotional life for many years. "I think of happiness beginning with my wife." His mother, to be consistent, tried hard to block his marriage. Throughout the period of his courtship he spent a great deal of time at his future wife's home. Her mother, his aunt, was a much more sympathetic person than his mother.

He went to Law School for a very short while. This had been the wish of his father. It had always been understood that this is what he would do, and being timid, he never dared disagree. But after a short time in Law School he decided to quit. And he mustered up his courage. Going to his father, "I told him that I was not going to be a lawyer. I think that was the first courageous thing I ever did."

He went to Medical School also, for one year, but this too was not what he wanted. Feeling that hundreds of hours of memorizing were not the best kind of education, he left. Most of his other undergraduate education was at City College, and then at Wisconsin. He chose Wisconsin as a place to study psychology. The basis for this choice was the faculty, but he discovered when he arrived that, "it was a fake catalogue, they just weren't there." But he stayed at Wisconsin, graduated and went on to do graduate work, receiving his doctorate there.

It was at Wisconsin that he first began "to emerge from (his) cocoon." This was, along with his marriage, one of the major steps that cut him off from the unhappiness and isolation of his childhood.

"This is what you call now a schizophrenogenic environment. A mother who was totally rejecting and totally selfish; a shadowy father; no friends; total isolation. How the hell I didn't become schizophrenic I don't know."

Growth and Maturity

"When I went to Wisconsin there was a change, in being treated by the professors as being one of them, like an equal, like an intellectual."

Young Maslow was something of an oddity at Wisconsin, but in a good sense. The young New Yorker was bright, eager to learn, full of intellectual curiosity, and he stood out among the "farm boys and country yokels" of Wisconsin. "I must have been the best student on the whole damn campus. The best student they ever had." He was also somewhat puppyish and eagerly filial, and his professors took him up, "they fed me, even helped me buy my clothes."

He became close to a number of his professors at Wisconsin, although "I never really respected any of them." Yet, the emergence from the cocoon of timidity was a slow process. At one time the Wisconsin Academy of Science announced a competition for an essay, the winning essay to be read at a meeting of the academy. Maslow submitted an entry, and won the contest. But when the day of the meeting came, "I just couldn't face them, I fled, and went for a long walk somewhere. Just never showed up at all."

Maslow's early work at Wisconsin was in the areas of comparative and experimental psychology, biology and neurophysiology. Here he began working with Harry Harlow on primate behavior and assisted Harlow in studies of delayed reactions of monkeys. This resulted in his first publication, with Harlow, in 1932. Although the work was dull, and repetitive, it succeeded in arousing his curiosity, more out of a desire for thoroughness in investigation than because of the inherent fascination of the topic. During the summer, back in New York, he found that the Bronx Zoo had a better group of monkeys than Wisconsin, and spent the summer running delayed reactions there. This resulted in another paper, on which Harlow asked to have his name also, although "he hadn't written a word of it."

It was while doing this tedious work that he had his first original, creative insight in psychology. He had noticed two striking things about the monkeys: the predominance of "domination behavior; and the screwing, which went on all the time—male and female, male and male, female and female, it didn't seem to make any difference." Being interested at the time in psychoanalytic theory, he had already become puzzled by the divergence between Freud and Adler. Freud placed all his emphasis on sex and social behavior; Adler saw everything in terms of dominance and subordination. So, "I started taking notes. I had two sets of note cards. And I wrote down everything I saw the monkeys doing. On one set, the Freudian set, I put down all the sexual behavior; on the other, the Adlerian set, all the dominance behavior. I had hundreds of these cards." While running thousands of dull delayed reaction tests, he would take notes on the behavior of the monkeys. And one day, he suddenly had an insight of the sort known to creativity theory as combining previously discrete elements. "Suddenly the two pairs of notes came together." He had realized that the two types of phenomena were not separate, for he saw that, "the dominant ones were always the ones who mounted the others." The insight that the sexual behavior was a manifestation of the dominance relations was an integration of Freud and Adler, and he became tremendously interested

in investigating this idea. This was, at the time, a novel and original insight. There had been some work similar to it, with chickens (pecking orders, etc.) but this was generally unknown, and was also not related in the same way to psychoanalytic theory.

He started studying this phenomenon systematically. In the course of demonstrating his hypothesis that the sexual behavior was mainly a manifestation of dominance, he made one of the first of his creative methodological innovations. In order to determine easily, and conclusively which monkey of a group was the dominant, he invented a new method. "I invented it, among others, without realizing it. I was so absorbed. To see which monkey was dominant, I took a big pipe, and dropped one piece of food in, so that it made a noise coming down. Skinner would call it an anticipatory stimulus. And then the dominant animal would always get it. The dominant monkey would get 100% of the food, not just a majority. That method is now standard" (cf. 1936a, 1936b, 1936c).

This research he undertook as a doctoral thesis project. His choice was not an easy one, for unfortunate reasons. Earlier, he had proposed a Master's thesis topic on aesthetic reactions, and it was turned down as unpsychological. A second topic was also refused, and he was forced to take a topic, "The effect of varying external conditions on learning, retention and reproduction," that was more in keeping with current conceptions of what a psychological project was. He was ashamed of the thesis and hated doing it. Later, "I snuck into the library one night, took my thesis out of the shelves and threw it out the window. I even tore the card out of the catalogue." But his professors insisted he send the thesis to a journal. "I finally agreed, I was sure it would get turned down by the editor. But I was fooled, they accepted it and it was published." However, in this case, as in the monkey work, he did find something that was interesting in the research although not what he was supposed to be doing; and published another paper, "The effect of varying time intervals between acts of learning with a note on proactive inhibition." This paper was, in 1934, one of the first discussions of the effect of pro-active inhibition, which eventually became one of the important aspects of memory research, an aspect up till then ignored by most studies, with resultant important defects.

When he proposed his doctoral topic he met with not much better luck. While it dealt with animal behavior, a psychologically kosher field, it also dealt with sexuality, which was decidedly terra non grata. "I was nobody's disciple. I was my own man. Even my doctoral dissertation—no one would sign for it, nobody wanted to sponsor it, so I went ahead and did it without a sponsor. They were all afraid of it." To do a doctoral thesis without a sponsor was certainly a daring thing for a student to do. "It was one of the most courageous things I have ever done." His intellectual curiosity and independence were able to overcome his timidity.

Just as it was finished, Solly Zuckerman, at the London Zoo, published a book demonstrating the same theory. Maslow's thesis, which was more complete and thorough, was never published. One reason for this is that when he left Wisconsin he originally planned

to continue his studies on the dominance and sexuality of monkeys. Some further work was done (cf. 1936a, 1936b) but he couldn't continue as he had planned. His idea had been to investigate the behavior by castrating the monkeys, and then administering hormones, so as to have better control. He needed to work some place that had adequate animal facilities, and neurological facilities as well; and he applied to the few places that met these qualifications. The request was turned down. The reason later turned out to have been anti-semitism.

The monkey research having reached an impasse, Maslow went from Wisconsin to New York, where he taught at Brooklyn College for fourteen years. New York, it turned out, was a very fortunate place to be. "It was, beyond a doubt, the center of the psychologist universe of that time" (1954, p. ix). It was there that he found those who were to become his first real teachers and colleagues. "In New York I met great people, understood what it meant to be an innovator, a discoverer, an inventor." The next few years were, for him, the most important learning experience in his life, an experience of a sort that few are lucky enough to have. But luck was not the important factor.

Apprentice in Athens

"It was like coming out of the dark into the light. It was like a farm boy coming to Athens." Abraham Maslow, Ph.D., Wisconsin, came to New York full of curiosity eagerness, and ambition. Dazzled by the light of this modern Athens, he set himself to learn as much as was humanly possible from the great men gracing "the center of the psychological universe of that time. Many of the great European and American originators were available, even to a young student, and I have many of them to thank for their kindness and patience. No young man has ever been so fortunate in his teachers and friends than I" (Maslow, 1954, p. ix). (In my discussion of this period I shall rely heavily upon the preface to *Motivation and Personality* (1954), which is a "very carefully thought out" acknowledgement of the mentors and colleagues Maslow met and learned from in New York.)

"Gestalt psychology was taught me by Max Wertheimer and Kurt Koffka at the New School for Social Research. Later I found in Kurt Goldstein my bridge between the holistic and the dynamic" (Maslow, 1954, p. ix). The gestalt-organismic influence was one of the important ones in the development of Maslow's theories. But equally important was the personal impact, especially of Max Wertheimer. In this instance, as in others, not only did Maslow actively seek out the great man, but he apprenticed himself in a devoted, filial manner. The model for his relationship with Wertheimer, as with others, was a father-son, teacher-student one, in which he sat at the feet of his mentor, eagerly learning and absorbing. The learning was not confined to words. for a young, timid man, starved for a father to admire and emulate, the attraction of such people

as Wertheimer was profound. He was fascinated by this man's character as well as his teaching, and this fascination with Wertheimer and others led eventually to the study of the self-actualizing personality.

One important fact about this period is not brought out in the preface to his book. This may be termed Maslow's unusual perceptiveness, which was combined with his eagerness and desire to learn. The people whom he sought out, and at whose feet he gratefully sat, were not being generally sought after at that time, incredible as it may seem now. "There were only three of us who regularly turned up at Wertheimer's seminars. And all three are top psychologists. There were Hy Witkin, Sol Asch and myself, and frequently no one else—even though we kept trying to drum up trade for the seminars." Only three regular students for a psychologist whom Maslow, at least, considers, "as great as Freud, except for the writings" (for Wertheimer wrote very little, "so you wouldn't know unless you knew him"). (Only those who were good enough to see Wertheimer's merit became his devoted students. "Asch gave up all his own work to help Wertheimer write *Productive Thinking*.")

This pattern of seeking out and apprenticing himself to the great thinkers around him brought Maslow into close relationships with many teachers. Having heard Erich Fromm lecture, he went to visit him, introduced himself, and began another filial relationship, learning whatever he could. He was a regular at Alfred Adler's Friday evening meetings for a number of years, "the only non-Adlerian who came at all regularly."

Not all of these mentors were men. It is understandable that his filial needs would certainly extend to women, perhaps to an even greater extent. Two women in particular influenced him. Karen Horney became an important teacher, to whom he was much attached, and from whom he learned much about psychoanalytic theory.

Along with Max Wertheimer, probably the most important teacher Maslow found in New York was Ruth Benedict. "She was motherly to me, or I was filial with her. I just loved her, everybody did. I tagged after her." As with Wertheimer, the influence was twofold. From Benedict he learned about anthropology, in particular the theories she was working on in the field of personality and culture. This was a new departure for Maslow, as it was a novel venture for psychology which had not at that point utilized the achievements of anthropology to any real extent. A paper, "Personality and Patterns of Culture" (1937), which he wrote at that time, was one of the first attempts by a psychologist to deal with these factors. Ruth Benedict, as a warm and wonderful person, towards whom he felt very filial, was one of the major models for Maslow's study of self-actualized people.

He also studied anthropology from Ralph Linton while still in Wisconsin, Margaret Mead, Gregory Bateson, Alexander Lesser, and Lucien and Jane Banks. At Ruth Benedict's suggestion he spent a summer on a field trip among the Northern Blackfoot Indians.

Other important influences were Gardner and Lois Murphy, who "treated me like a son," Ruth Monroe and E. L. Thorndike. Thorndike took him on as a research assistant, supported and encouraged him. "He taught me much about kindness and nobility that he never put down in writing" (Maslow, 1954, p. x).

These relationships were mostly on a parent-son model, in which Maslow listened while his teachers talked. His relations with peers, with friends and colleagues, when they were meaningful, tended to be ones in which he talked and they listened. His best friend at that time, Rod Menzies, who died prematurely, was both fatherly and protective, and listened to him.

Since then he has had very few real peers, in the sense of give and take. While at Berkeley for two years (not at the University) he met Elsa Frankel-Brunswick, from whom he learned a good deal. She arranged an informal seminar which met during those years, in which Krech, MacKinnon, Mandelbaum, Sanford and Tolman participated, but there too, "I was talking. I was explaining my new theories, they were listening."

At Brandeis, where he has been since 1951, he feels that he has peers, in an intellectual sense, and he has learned from them (cf. 1962a. Acknowledgments). But the sort of peer he would like, he doesn't have. "The closest approximation, in that real sense of argument, is Frank Manuel, but he thinks all my work is a lot of shit. Our talks are very good debates."

Coming from an affection-deprived childhood, he was able to form strong filial-learning relations with his mentors. As an established psychologist he finds audiences and colleagues to whom he talks. But a peer relation of equality and common interest he has not been able to find.

"I have nobody in the whole world to talk with about my own work, I decided some time ago. I am a lonely worker. When I want to have a conversation, it is with myself, I have a whole drawerful of journals." Much of Maslow's thinking is done in the form of long journal notations, a practice he has utilized for many years. One such set of notes was dictated into a tape-recorder, and transcribed later and printed as *Summer Notes on Social Psychology of Industry and Management* (1962b). "What does all that sum up? Loneliness, intellectual loneliness. Usually I don't mind, but sometimes I just feel lonely. I recognize, when I can have a good chat with somebody how exhilarated I get, how happy and excited. For me talking is such a part of thinking. I can talk something out and I know I am more intelligent then, more creative. The best stuff I have ever done has been like playing a basketball back and forth. I have been isolating myself more and more, trying to get detached, leaving the world. Partly because I am disappointed with Brandeis, with the administration; especially in the last six months, I've sort of given up."

At Brooklyn College Maslow found enjoyment and satisfaction in teaching, he was one of the most popular teachers, his courses were mobbed. I do not know how much

of this satisfaction was the sort reported by Simon and Rokeach, of being able to clarify ideas in the communication of teaching. I suspect it was largely an enjoyment of having eager students, whose attitude was somewhat filial, as his was in turn to his teachers. The role of a good, kind father, educating and helping his students (he even organized an informal class in etiquette for his Brooklyn students), is one with much satisfaction to offer. At Brandeis, however, this has not been the case. Another generation of students, less eager to apprentice themselves than the depression days students of Brooklyn, have been more interested in spoon-feeding, uninvolved learning process, which has not been satisfying or stimulating for the most part. This need has been filled by speaking to all sorts of groups in other colleges, in history, in management training, and so on. In such situations, he feels, he is listened to with the sort of eager, alive interest that he enjoys. It is in such situations that he feels used well, "like a cow with a full teat." As the Jewish saying goes, "more than the calf enjoys sucking the cow's milk, the cow enjoys suckling the calf." At Brandeis this has not been the case, and Maslow feels that "if I had the money, I would stop teaching tomorrow. It isn't worth the time."

Out of the Prison-house

"Shades of the prison-house begin to close upon the growing boy." Wordsworth's pessimistic depiction of the process of growth and maturation is the opposite of the gradual opening of the prison-house of fear, inferiority, and timidity in which Abraham Maslow had been enclosed during his unhappy childhood. In his discussion of the sections of the outline (Chapter II; II) dealing with motivation and personality, the predominant feature is the slow replacement of timidity and fear with confidence, of unhappiness with happiness, of inferiority with realistic self-awareness of health and creativity. The emergence from the cocoon was a slow, difficult journey from deficiency to a state of fuller being.

"Achievement motivation. I would have to rephrase that. I'd call it a sense of dedication for myself. First of all, I remember as a youngster, right through the first years of college, in New York, simply mopping up education. Schools, lectures, any lecture in the goddamned city and I was there. Plays, and concerts, every week and so on. It sounds crazy, but the [*sic*], I was never home. I remember very well, sitting in Cooper Union, and always being awed by the people on the platform, but they were so far distant that I don't think it ever occurred to me that I could be like them. I remember hearing Bertrand Russell there—those were my heroes. I didn't aspire, I felt too inferior to think of such a wild thing, to be one of those gods! I didn't even think of it, until someplace around the middle years in college, I remember then dedicating myself to that. There is one image in my head. I was all alone in a plant where I had a job. I had a key so I could go there and be alone. And I was reading Sumner's *Folkways*, which changed my whole life, just

inspired me. I remember it was one of the first times it dawned on me that I could be one of these godlike creatures, I could make contributions. And then I remember thinking, in an adolescent way, that I would die content if I could make a contribution to philosophy, to anthropology, to psychology. I don't know why I picked them. I don't know whether I felt then I am going to try and do it, or whether this was too far ahead of me. Maybe this was the beginning of aspiration, the dream, that wouldn't this be a wonderful thing. I also remember thinking that if I could do that, then I would be like those people I admired, and then I could be with them, get to know them. Later, only, when I went to Wisconsin, there was a change, in being treated by the professors as being one of them, like an equal, like an intellectual. It doesn't feel like n-ach in McClelland's sense, the ambitions I had, I think I could have done anonymously just as well. I don't think I would have done much different if it were all anonymous."

"It was like somebody deciding to be a nun, or a communist party member. I don't think it happened in a moment, it happened through years. It was a slow development out [*sic*] absolute inferiority and feelings of worthlessness, into a slow acceptance of the fact that I could do things. And my aspiration level just went higher and higher, ever since then, to this day, it still keeps going higher all the time."

"I wanted to be a good psychologist, and I did all the things that a conniving, shrewd, ambitious young man would do; joined everything and so on. But I think that was really secondary to making a contribution. Contribution is the real word here. If I hadn't felt that I could make a contribution, I would have left the field. Being a big shot made no difference. I trained myself in a way that I've never heard of anyone else doing. I took courses which I hated, learnt chemistry; did anthropological field work that I was afraid of, shy about doing; I took mathematics; I took every goddamned thing, whether I liked it or not. The only question was, would it make me a better psychologist? In that sense I was a professional, totally devoted; training myself, as it happens, very well."

"There is now emerging over the horizon a new conception of human sickness and of human health, a psychology that I find so thrilling and so full of wonderful possibilities that I yield to the temptation to present it publicly even before it is checked and confirmed, and therefore before it can be called reliable scientific knowledge" (1962a, p. 3). The person who wrote this can be said, I believe, to have a sense of destiny, perhaps even the zeal of a crusading prophet. But these words, written in 1962 (part of a lecture given, fittingly, at Cooper Union), would not have been possible for Abraham Maslow in the days of admiring from afar the gods of the intellectual world.

"The sense of destiny, yes. But that grew slowly. The full consciousness of it might not have come until I returned to New York after the Ph.D. Something happened there. I came to New York and got a job with Thorndike, that was an act of charity on his part. He picked somebody bright and just supported him. And then he tested me. They gave me tests until I was blue in the face, tested for weeks. And it turned out by the

careful testing that I had an IQ of 195. Then he checked with a lot of other tests, and in all the tests that I took I made the second highest score ever recorded. Then they told me about it. It was shocking you might say, it dazed me—I walked around in a daze, trying to assimilate this. It went with my consciousness, cause consciously I knew I was smart. But unconsciously it was neurotic, I had this feeling of stupidity, along with a conscious smartness. This confrontation really made turmoil, and it had to be worked through (partly in analysis) and assimilated; and it took a long time, years even, because it contradicted my whole self image. When somebody disagreed with me my tendency always was, 'well I must be wrong.' But this supported me against people who disagreed with me. My impulse would be, 'well he knows better, or he's sure of himself,' and then I would say, 'but look at my IQ, maybe I am right, I am smarter than he is.' It was a source of courage through those years and enabled me to be creative."

"I know now that the work I spontaneously pick out for myself, nobody else could do, certainly not as well, and therefore I'd better do it, therefore I'd better not spend any time doing anything that somebody else might be able to do."

The gradual emergence of self-confidence, and a sense of destiny, has not entirely banished the timidity. "Enjoyment of the iconoclastic role? It's there along with the timidity. I don't like that role of standing up there in front of them and spitting in their eye, it's not for me."

"I was independent all right, but I think that came as a slow development from timidity. I think I was independent before, but I kept my mouth shut about it. I am still more a mediating type, compromising, integrating, pulling together, rather than a fighter. Independent, but with that modification. I certainly was independent with that incident with my Ph.D. thesis. No one would sponsor it, and I told them all to go to hell, and went ahead and did it. I am independent intellectually, just easily, spontaneously; it's the behavior, where I get into conflicts, when I have fears."

None of the subjects reported feeling any pressure on them to publish. They all felt that writing was a natural outgrowth of their work.

"Publish or perish? No such pressure. I publish as naturally as a bird sings. It's no effort, and furthermore, I think I would publish exactly the same if I had to put your name on it, kept it a secret. It would make no difference. I don't say that; but the pleasures are epiphenomenal only, not essential. I like getting applause, but it's not really necessary. I think it used to be when I was younger but I've gotten enough of it."

The question of self-actualization is a difficult one in this case for obvious reasons.

"I'd say all my needs are satisfied, now; but that all were unsatisfied, up to the time of my marriage, and beyond. I was totally isolated, ungratified, unhappy. My whole childhood looks to me black, and I think of happiness beginning with my wife. When I kissed her the first time, my life began then, I think. Today certainly all my needs are satisfied, but there was a transition in between. And in my dreams that youngster is not lost altogether."

"Would I call myself self-actualized? God knows. If you invent something, then you get so self-conscious about it, it would be impossible to say. How much of it is trying—after all, I took these people as models to some extent, I admired them so much. How much is acting, is hard to tell. How much is imitation that becomes so good that it is automatic and spontaneous, and what does that mean? It would be hard to say. I think there are hangovers from a very pathogenic childhood which are not lost altogether, and there are symptoms every once in a while, of tension. My sleep gets very bad, then I get tense. I think for a person who is as self-conscious as I have to be about all of these things, I think about them all the time, that the possibility of spontaneity is lost. Expressive, yes. Aggressive, certainly analysis made it possible for me to be as aggressive as I have to be, when necessary. It still takes self-conscious and deliberate will. Love? I am a good lover, able to love."

"I think I am creative, so much so that I am almost inclined to define things in terms of myself, which is dangerous and stupid. It has to be pluralistic. Why do I think I am creative? Because I have created a lot, and I can whenever I have to. It's not general though. For example, I am not creative artistically. I have tried to be, tried painting and dancing, tried musical instruments, I used to compose a lot; but really it's just intellectual work, and there it has always been creative, so far back as I can remember."

"I used to do both primary and secondary creativeness, but I have given up experimentation. I see my creativeness now as philosophical, speculative, theoretical. I would admire myself more if I also carried out the experiments, even though I figure I haven't got the time. I've got only, I figure, a good reasonable 10 years more of life, and I have so many things I want to do. Experiments take so goddamn long. So I have a very good reason, rationalization for it, for sticking to my theories, which no one else can do. But the truth is, I don't even feel like doing experiments."

"Creativeness is effortless for me, but that may be part of the way which I work, I never push it. My whole style of work is to be inspired, you might say, and then to work in a great gush, and when that's finished to turn away and go play, or do something else, till another inspiration hits me. You might say this is a priori effortless. When I have to do it, I do it, but don't enjoy it nearly so much."

"Peak experiences. I invented them. For me, well, they get less and less, year by year. I get more and more professional in working, narrowed down, less and less from other things. I think everybody reports that. I am more stale emotionally now, less reactive. Also, I have played many things out. Music, I used practically to die with it. Any piece in the standard repertoire, I can remember, like a sweetheart, the first time I heard it. I would cry. Now I don't get peak experiences from music, or from art, which I did also. I can still get them occasionally from dancing, watching beautiful dancing. From natural beauty. My kicks will come out of my work mostly. And everything else turns into a lider [*sic*] kick now. When I first kissed my wife, I almost died; now it's more even,

more domestic, although very profound. Ideas, work—I get big thrills out of my own discoveries, mostly, or out of people's discoveries. Partly it's a preparation for death. I have so much work to do which I'll never be able to finish. Quite spontaneously, I prefer to be right here, with my books and my papers, rather than to travel, or go to a concert, or a play. The world narrows down. I am a psychologist more and more and more. Less and less interested in the world, people."

Maslow also reported feelings of great joy, even peak experiences, resulting from good things happening in the world, such as an important Supreme Court decision. These I would call altruistic peaks. He also reports great excitement and joy from seeing people who try to do things well, whatever they are doing. Especially from people who are contributing to the world, writing books, developing ideas, working for justice. "In the 12th century people would not have hesitated to use the word saint, doing God's work on earth. I despise anyone who can go through life without making any contribution to the world. Playing bridge or something."

"Life goals, fulfilled, absolutely. I am a very fortunate man, nothing is missing. The only dream I have is if I could have a lot of money, I would like to devote myself full time to my work, and to have the secretaries, research assistants and so on. That would simply then double, triple and quadruple my work. But there's no change in substance, I'd simply like to do more of it, not to be distracted. When I dream, it's about secretaries and research assistants. And for a longer life span. I hope I can live long enough to do more of the project I want to do. I'll never live long enough, because jobs will keep developing, but the longer I live the better I'll take it. As long as I can work. I think it would be a great pity when I die, because it would be a great loss, if I am working at the time. But if I can't work, then I don't have any more claim on life than anyone else."

"I feel myself to be very fortunate. I am very grateful. My job is what I am interested in, I am permitted to give a course in what I am interested in. I wasn't just assigned something. I am aware of the affluent society, that is so rich that it can pay me to sit and think, so I feel lucky. Lucky in another sense. To be the carrier of talent. It is a problem, and it destroyed my childhood. On the other hand, it is a privilege, and though it's made problems, I am very happy about them, I am very happy to be smart, it's fun. What a dull thing it must be to be of average intelligence. I can have every fun they have and a lot more."

Toward a Psychology of Being

"I think of my whole life's work in retrospect as being unified, though it couldn't look like that." I think we can view Maslow's creative work first of all under the general, paradigmatic question of, "Why do people want what they want, and do what they do?" In other words, what motivates people? Why do healthy people behave one way,

and unhealthy people another way? Why do people grow? What are the biological, psychological, cultural determinants of motivation?

"The question of motivation I picked up very early, just being intrinsically interesting, just fascinated me. Probably has irrational, psychoanalytic roots. The rationalization, just thinking it out, it seemed to me to be just the most important, the most basic thing in all of psychology. Since I wanted to do important work, I remember asking myself, 'What's the most important way I can spend my time?' And then it turned out to be motivation. Maybe that came out of Freud, and Adler, that I was reading as a graduate student. Partly, I think also it came out of the failure of the behaviorist program. I went into psychology as a behaviorist. I read Watson, then I did work on conditioning, and various studies of learning, but it slowly struck me that the whole program was no good. The whole promise of behaviorism which I had seen, which drew me to Wisconsin, was worthless. Partly, I became less interested in learning, and more in the deepest motivations of human beings. I thought this was more important, just logically and psychologically prior, more radical, more fundamental than anything else."

The over-all question was posed, then, over against a background of the behaviorist methods and theory that he had previously been committed to. The formulation involved, therefore, the rejection of formerly accepted belief systems. That the question was paradigmatic we can only verify from its working out in terms of sub-problems and their solutions. I think that this will be seen clearly in the following.

The first major sub-question that Maslow posed was in itself a paradigmatic one. The question grew out of his interest in psychoanalytic theory. He became aware of the rival claims of the various psychoanalytic schools to have the key to human pathology and tried to find an answer which would put them together, because they all seemed to be right. "Which ever one I read, seemed to be right, while I was reading it. Then I would read another, and that seemed right." The question he asked was, "What makes people neurotic?" This is, of course, a fundamental question of psychoanalysis, therefore, not his original question, yet the posing of the problem as that of finding the solution that fits all the theories, is original. And creative in an integrative sense. How did he come to this?

"After I came to New York, many things happened simultaneously. One of them was that I got involved with the psychosomatic, psychoanalytic group. This was David Levy and Abram Kardiner, who were my friends. They were already moving away from orthodox psychoanalysis, and in this group, which met for several years, I gave this motivation paper (1943) first. This was essentially my effort to pull together for myself the seemingly contradictory planes of Freud, Jung, Adler, Fromm and Horney. (It was such a desire to reconcile Freud and Adler that earlier led to the insight on sexual and dominance behavior among monkeys.) It dawned on me that they were all correct, but that each was pushing too much at one exclusive thing. I had read Freud, I was actually

studying with Adler, and with Fromm and with Horney. They were all correct, only some things were more fundamental than others, and the whole enterprise was, anyway, psychoanalytic. That motivation business is really on the Freudian paradigm of instincts which are frustrated producing illness. My idea was to take the neurotic adult and to trace back where he went wrong, where the frustration was—reconstructive biology. That was psychoanalytic and the academic side coming together. What people want, and what they need, and what they are looking for out of life."

He later summed up this part of the research as follows:

> My original question was about psychopathogenesis. "What makes people neurotic?" My answer (a modification of and, I think, an improvement upon the analytic one) was, in brief, that neurosis seemed, at its core, and its beginning, to be a deficiency disease; that it was born out of being deprived of certain satisfactions which I called needs in the same sense that water and amino acids and calcium are needs, namely that their absence causes illness. Most neuroses involved, along with other complex determinants, ungratified wishes for safety, for belongingness, and identification, for close love relationships and for respect and prestige (1962a, p. 19).

This work was based not only upon the psychoanalytic data and theories that he was trying to integrate, it also utilized a great deal of biological and neurophysiological knowledge, which contributed to its effectiveness in bringing together the psychoanalytic and physiological concepts of deficiency and frustration. It incorporated the Freudian views on the needs for love and belonging, the Adlerian ideas on the need for power and prestige, and put them in a clear framework, the hierarchy of basic needs.

The impulse to integrate, the wish to view all of the disparate theories as aspects of a larger whole, reflects the influence of the gestalt-organismic-holistic school he had absorbed from Wertheimer and Goldstein. But there was more to this inquiry than the question of pathogenesis. There was also the further question, which in many ways was both more creative and more important, "What motivates the person whose safety, belonging, love and power needs are satisfied?" How did this question come into being?

"About the same time, I was involved with anthropology, and that had a relation to the self-actualizing business in a very personal way, because of Ruth Benedict. She was motherly to me, or I was filial with her. I just loved her, everybody did. I tagged after her. She kept pressing me, saying I was too Western, I was too busy, I was too ambitious, driving, and so on. She gave me things to read, poetry, various things, supposed to teach me to be more Eastern. I never got the point, although I think I understand now. But she herself was a model, so obviously serene and calm, that I had to understand her. So I worked on her, and at the same time on Max Wertheimer, another of my models. She happened to have been working with this culture and personality thing, that's why I went out to the Blackfoot Indians, she picked them out for me. It was a secure society, with high synergy. So I was much involved with healthy and unhealthy people."

"At the same time I was writing that abnormal psychology book (1941), and I had to write a chapter on the normal personality. Why? I don't know, it just seemed sensible. And I realized how little was known about it, so I simply wrote an arbitrary chapter—I

thought so, so I wrote it, that was enough. I felt dissatisfied with it, and then thought of working at it more carefully. Part of this interest was at Brooklyn College. I started teaching a course, for the first time, on the normal personality. I just created it."

"Then I read Goldstein's stuff, where he talks about self-actualization. And I was in on Wertheimer's seminars. All of these were important. Then I was interested in psychotherapy, and just started doing it, without any training. Just did it. And that brought up the question of the goals of therapy. Where are you going? Just getting rid of symptoms is for me not satisfying enough. This was a source for this stuff on health, the good society, the good person."

"I think this is also very Jewish, this looking for the good world, and the ideal man. In the midst of the antisemitism—why were people nasty, and what were good people like? And then, especially for the Jewish boy, I would love the good person six times as much as anybody, and hate six times as much, a bad person. So it was very much a hot topic. It was a personal problem, and this was sort of self therapy and self exploration."

The study of Ruth Benedict, Max Wertheimer and other healthy and creative people led eventually to the theories on self-actualizing behavior which placed the need to self-actualize at the head of the hierarchy of human motives. This was first written down about 1943, entitled "Self-actualization: A Study of Psychological Health"; yet this was such a radical departure in psychology, for all that it was based on Goldstein, Fromm, Horney and others, that timidity won out again. "It was seven years before I summoned up enough courage to print it" (1954, p. xiii).

The book that resulted from this research, *Motivation and Personality* (1954), included an exposition on psychology as a science, and on the holistic-dynamic method used by Maslow; the theory of human motivation mentioned above; and detailed discussions of the nature of the self-actualized person. The book ended with a chapter which brought up many of the implications of this new view, of this recentering of psychology around a postulated positive drive for health, growth and realization. Much of the ideas in this chapter were conceived in a moment of great insight, a peak experience.

"I had a particular insight, a peak experience insight, while I was writing the '54 book. This was the great climax for me of all this stuff on motivation and self actualization. I was on a train. (Shades of Wertheimer, Poincaré!) Trains are always sort of special places, I feel cut off from everything, alone. I wrote out the whole business and I called it 'higher ceilings for psychology.' I wrote out all the implications for science, for psychology, for the theory of science, for the theory of society, for the theory of every goddamned thing. The implications of this picture of the more fully developed human being. And much of that I put into the book, in the last chapters on values and ideals. And ever since then I have had this picture of the revolution in psychology, and therefore in all the social sciences, therefore in everything. It's simply a different conception of knowledge. And that's what I have been playing with ever since."

It is this vision of a new concept of psychology that we have already seen above, of the new conception of sickness and of health, a psychology "coming over the horizon," that Maslow finds thrilling and full of wonderful possibilities. In his later book (1962a), he calls this "larger jurisdiction for psychology."

After the first book, Maslow pursued further the implications he had traced from his paradigmatic recentering of psychology. The question here was, what is the nature of the motivation that exists in people who are self-actualizing, whose basic needs are satisfied?

The major step in answering this question was the realization that there have to be two qualitatively different types of motivation. The first type includes those motives that derive from unfulfilled needs, unsatisfied wishes. These are deficiency-needs, motivated by deficiencies in the basic needs of the human being. The second type exists in the person whose needs are satisfied. These are not deficiency motivated but stem rather from an inherent drive to fulfill the potentialities of the human being, to achieve an ever more realized and actualized state. These, spontaneous, internally produced growth drives are not deficiency but "being" motives. It is not enough to satisfy the basic needs, one has the need to arrive at ever fuller states of being. This is one of the important leaps in the humanistic psychology developed by Maslow.

One aspect of the investigation of the being-motives and the being psychology, was of the happiest, most ecstatic moments in the lives of all human beings, not only the self-actualized. It turned out that almost anybody can report such experiences, which Maslow termed peak experiences, and these have certain common characteristics. What they are, in essence, he postulated, is transient moments of being in which people can glimpse the pastures of this heaven of psychological fullness. They are moments of love, of creative insight, of achievement, and so on. We have already seen some in the reports of our subjects.

The concept of actions and perceptions motivated not by need, by coping in the old sense; but rather expressive, even gratuitous, spontaneous, this was achieved in the face of a large body of contrary opinion and theory. As the previous steps, if not more so, this involved the rejection of old modes of thought.

> Because it is so new, the exploration of the highest reaches of human nature and of its ultimate possibilities and aspirations is a difficult and tortuous task. It has involved for me the continuous destruction of cherished axioms, the perpetual coping with seeming paradoxes, contradictions, and vagueness and the occasional collapse around my ears of long established, firmly believed in and seemingly unassailable laws of psychology. Often these have turned out to be no laws at all but only rules for living in a state of mild and chronic psychopathology, of stunting and crippling immaturity which we don't notice because most others have this same disease that we have (1962a, p. 67f).

"My experiments were generally not planned, I was doing them out of curiosity. I was a curious person, looking around, and after I was through I would realize that it was an investigation. My motivation theory, I didn't realize it was done until it was done, I was just absorbed with a personal interest. It wasn't designed, planned. That peak

experience work, I didn't realize I had an investigation till it was all finished, sort of. It would be like a nosy or curious person, absorbed in something. I invented methods by the dozen, without realizing it, I was so absorbed."

"The gathering of information is sort of half conscious, it's only afterwards, a long time later I realize I've been gathering information. Usually nobody had asked my questions. I think that in all these things I was just pioneering. Although I never thought so then. Maybe that's why I never thought I was doing scientific work, professional work. It was a kind of personal curiosity. It was only later I started reading on it."

"I've rarely made a mistake. It sounds crazy, but for such a sloppy guy, I've never had to modify. Actually there have been some minor modifications, but none from psychology. All the things I have published have stood."

"Storage of information. I have many files. I have a bad memory, so everything has to be written down. Storing information is very important. I have journals, diaries. I have a list of all the books I've read since the age of 13. That's true of the oral character—greed to read every book, and do everything. I hate to let an idea go, so they're all written down. If I live 600 years I couldn't work out all those things."

"My custom has been to be doing 20, 30, 40 projects at once. I have them all listed in my journal. My file cabinets are full of projects. Then I have a bulletin board with things that I am doing, things to finish, and so on. The six or eight I am actively working on right now. I hate to be pressed, I hate calendar creativity."

"I don't analyze, I synthesize. Putting things together. Simplifying, boiling down in the holistic way. My thinking tends to be a restructuring of the whole, rather than adding three new facts or anything like that. Ideas come out of an inspiration, a clicking together of something. A realization of the implications; and it's apt to come in a great burst of insight. The dramatic moments are the easiest ones to remember, all the working through you don't remember. And I have a lousy memory."

"The motivation paper, for instance. I wasn't terribly impressed with it myself. It sort of seemed like routine work. I knocked it together for that psychoanalysis group. I don't remember any peak experience with that paper. It just grew, and represented my attempt at systematizing this field of motivation, with its rival plans, putting together what was right, excluding what wasn't. That book (1954) was an afterthought. I had some notion of what I wanted to do, all through the separate pieces. A synthetic job, putting together the holistic and the dynamic, the cultural and the biological, Freud and Adler, and so on. But each step was a sort of groping, they weren't planned."

The cumulative impression from all of these reports on his working methods and attitudes is one of an intuitive, curious person, pursuing questions that fascinate him, inventing new methods if necessary, without too much concern for methodology, and ending up with an integrative, novel and exciting insight which is something of a surprise. Yet, somehow, this intuitive solving of problems which seems so aimless, is not

as haphazard as it looks. There is after all a central question and a definite progression from one major integrative question, with its answer implying further questions, to the next; all of which, retrospectively at least, seems very orderly. And it all adds up to an increasingly broad, cumulative, conceptualization of human nature. Significant questions, violating previous beliefs and assumptions, there certainly are. Derivative, and no less significant questions, also radical departures, are followed up and integrated into the whole. For all the apparent lack of logical predetermined plan, Maslow's work seems to be following a path dictated by a certain necessity, a continuous and unified line. The end of the path is not yet in sight, it lies somewhere in the distance in as yet uncharted territory. But the ultimate goal is "the construction of a comprehensive, systematic and empirically based general psychology which includes both the depths and heights of human nature" (1962a, p. iv).

Chapter VI: David C. McClelland: The Need to Achieve

doi

A large portion of the professional research performed by David McClelland has dealt with the nature of human motivation, and the achievement motive in particular. Many of his numerous papers, and five of the six books he has written, edited, and collaborated on, are concerned with questions of the origins and expression of human needs and motives.

David McClelland is professor of psychology and chairman of the Department of Social Relations at Harvard University. His many research activities have been complemented by a willingness to participate in administrative and advisory capacities in such bodies as the Ford Foundation, the Fulbright Advisory Panel, the Social Science Research Council, and the National Institute of Mental Health. The extent of this participation, greater than for any of the other subjects, indicates a certain consciousness or acceptance of the social responsibilities of his theoretical life that is an important characteristic of his personality. I think it is clear that the motive is not, consciously, a desire for power. I think we will see that it is rather an outgrowth of certain personal, perhaps even religious traits. A more important example of this is the fact that during the current year (1963–64) he is attempting to apply his theory to the task of improving society, by attempting to actually stimulate the need for achievement in the populations of underdeveloped nations.

The interview, 3 hours in length, took place August 24th, 1963, at the Department of Social Relations, Harvard University.

Growing Up

"I was brought up really as prepared for a career in education." David McClelland was the son of the President of a Methodist women's college. His mother was an educated

woman and very much culture oriented, although non-academic. His uncle was at one time President of the University of Pennsylvania. The influence of the academic environment was an important one in molding his early interests. Another important influence was his paternal grandfather, a Scottish immigrant who had been a judge, and had gone far in Democratic politics, at one time speaker of the New York Senate, and a friend of Theodore Roosevelt.

"My general family background was one of intellectual, religious orientation, combined with a good deal of strictness. There were codes of what we could do and what we couldn't do." There were five children. McClelland had an older sister and brother and two younger sisters. His parents put a great deal of pressure on his older sister to follow an academic, professional career. "My older brother had fights with my parents over school work. I didn't want to get into this kind of a battle." Besides the fact that he was a younger child, he was also more protected by his parents because of his physical condition. At an early age he had severe pneumonia, after which his parents considered him "a delicate child. They kept me out of school for a few years, and I was taught by my mother." Only later, when his father became president of the college and they moved from New York State, where he was born, to Illinois, did he enter public school.

Because of his mother's teaching, when he entered the third grade in Ohio, he "was way ahead of them, and that's the way it was all the way through graduate school. School work was always easy, and I enjoyed annoying the teachers by knowing things they didn't know."

If the school was not a place in which he was intellectually stimulated to a great extent, this was largely due to the effect of the environment of the college his father headed. The teachers he remembers as being important were in the college, two in particular. These were professors of language, Greek and German. Upon graduating high school a year early, he spent a year before entering college improving his Latin and studying German and Greek with these teachers.

McClelland went to Wesleyan University, his father's alma mater (where, in fact, he studied with many of his father's teachers), intending to pursue his linguistic studies. He now reads six languages. It was only later that he fell under the influence of a professor of psychology and decided on this as his field.

Besides language McClelland's other major intellectual interest was in chess. His fancy was caught at an early age by the imaginative possibilities of these problems. "My first publication, at the age of 12 or so, was a chess problem." During his high school years chess was one of his major interests and he published many chess problems, although he was never as interested, or as proficient in the actual playing of the game. "I think I participated in some regional tournaments, in which I never did very well." The fascination was in the problem-solving aspects, and the more imaginative and unconventional type of "fairy chess."

McClelland was certainly not a social isolate. He had friends, and participated in social activities. He acted a good deal, playing lead roles in many high school plays. But there was an alternation of periods of active social life, and of withdrawal into isolation and intellectual preoccupation with chess, languages, writing, and so on. "I would suddenly have enough (social life) and go off by myself for a while and do other things." At this time he even wrote a play in Latin.

"Our high school was a big one, but I had, I realize now, a rather small circle of friends. All from bourgeois families, and all later moved away from the town, Jacksonville, and have successful careers in the city, elsewhere."

At Wesleyan he began studying languages, continuing his previous interest. His older sister had also pursued a career in languages, in French. But as a sophomore he "took a course in introductory psychology, from John McGeoch, who was a very impressive man. His passion was psychology as a science, and in addition he was, I thought, a deeply educated man. He converted me to psychology, as a subject in which I really wanted to do some research. And I very soon decided, looking back on it, with no hesitation, that I wanted to be a psychologist. Started doing research almost immediately. He took a great interest in students, and in me in particular, and greatly encouraged me to go on in graduate study in psychology. He was known by psychologists as a person who was interested in paired associate learning and so on, but he had much wider and deeper humanistic interests. I was influenced by him in my choice of research problems and worked, really, right up through the Ph.D. on problems in learning and memory of the old-fashioned sort. The last two years of college were ones of increasing specialization. My horizons had been broadened before college, more than in college. Spent a lot of time studying rather narrow problems in human learning. However, in my senior year, I did two theses, one in learning and the other in social planning. I had been in a Friends Service Camp that summer, and had studied the TVA. I wrote a thesis on this under the one other teacher who influenced me there, namely Sigmund Neumann. He introduced me to what sociology I knew about, although he was more political sociology. I probably always looked down on sociology, till much later. [Another important professor was a Quaker, as were several classmates] and I decided that the Quaker religion was one I could stand much more than the Methodist Church in which I had been brought up. I had sort of revolted against Methodism, and this seemed a more congenial and less authoritarian religion. I didn't give it up wholly, as did most of my generation, but converted into a more radical form. I also met my future wife in that work camp, and we were married right after my senior year. By the age of 21 I was already married and well on my way towards the Ph.D."

"From Wesleyan I went to the University of Missouri, because McGeoch had come from there himself, and he wanted me to go study with one of his former students (Melton) for at least a year. A great deal of my professional knowledge was acquired at

Wesleyan and at Missouri, where I got a Masters in one year. And then went on to Yale, where Melton had been at graduate school. And I felt, as often in my academic career, that by the time I got to Yale, I knew practically everything that I would have to learn for my Ph.D. having learned it earlier; so that my two years there were something of an anticlimax. I didn't broaden out to learn very much of anything, my idea was to get my degree as fast as possible and get out. So I chose a rather easy problem for my thesis, and did it all in two years. My teachers at Yale had nothing like the influence of McGeoch or Melton. I worked under Hovland, whom I never got close to. I think Hull had probably the greatest influence on me, although, really in a negative way. I admired very much his care and precision, and his views about measuring, operationalizing rather subtle things. His point was, almost anybody could talk a good game in psychology, but this wasn't science. He made a great impression, not so much for what he did, but for his passion for science and hard work. My advanced graduate training was more in the nature of specialization than it was broadening; that had come much earlier. A fellow student there was Charles Osgood, but we hardly saw each other. He was known as a social psychologist, and we looked down on them. Oddly, many of his interests now are close to mine."

From Yale McClelland returned to Wesleyan, still working on learning problems of the sort he had begun under McGeoch. "The biggest change in my research interests occurred quite by accident. During the war, as a conscientious objector, I took a job with the Friends Service Committee in Philadelphia, administering one of their departments. (And I have never since been uninvolved with administrative duties of one sort or another.) While there I taught for a year at Bryn Mawr, and quite by accident I was elected to teach the courses in abnormal psychology and personality, which I really knew nothing about. I inherited MacKinnon's courses and also his office and his library. And, in preparation for the courses, I read through his library on personality. I had never even read Freud. And I have been working in personality ever since."

After the war he returned once more to Wesleyan, where by now he was working in personality. He also taught in a program initiated by Nathan Pusey, now president of Harvard, then of Wesleyan, in which every faculty member taught a section of a general humanities course. McClelland, with his knowledge of Greek and Latin, was well prepared for this venture, which he enjoyed greatly and found very stimulating. "I spent large sections of my time with non-psychologists, which I really prefer."

But aside from this brief excursion, the remainder of his professional research and teaching has been in psychology, to which he devotes time and effort in a manner reminiscent of Hull. "I have never been able to do anything that I start doing badly, without feeling badly about it. So I have always been working overtime, Sundays, weekends, and never really have taken much time off." This dedication has not prevented him from participating in administrative and advisory duties. "I don't feel really that I have

been in an ivory tower, but have always been coming out into life and coming back to the ivory tower. Which is still true today. In my year off, coming up, I will be working with governments on the problems of economic development, training in motivation, that might lead to economic development."

As opposed to Simon and Rokeach, and in a way to Maslow, we cannot identify as yet in McClelland the point at which he formulated a paradigmatic question which was to be the unifying theme of his later work. He chose psychology under McGeoch's influence, and worked for years in the framework of McGeoch and Melton. The change to personality as an area of inquiry came about accidentally, without any conscious change of belief system or framework. We will find, in the following, that he never did arrive at such a paradigm around which he recentered his view of psychology. His major significant recentering was more in choosing a specific area, a specific question, which became paradigmatic in the process of a very thorough following out of all its implications, without ever causing a radical restructuring of the science.

Motivation and Personality

"I don't know what to say about achievement motivation; it's very difficult for me to separate research interest in measuring achievement motivation from my own motives. It may be that I have developed more n-ach by studying it so long and so hard. I think initially, and this is still really true, in terms of my subjective impression of what I was interested in, I was really attracted by the puzzle characteristics of various things. It goes way back to setting up chess problems. I like to find out the key that explains something, so that I understand it better. I think I have a certain amount of n-ach. I always think of that as my father's side of me."

Here McClelland refers to what he considers an important aspect of his personality. His father was an intellectual certainly, but not in the deep, intuitive sense that his mother was. His father was more a worldly, mediating type. His mother was a profoundly cultural intellectual in an imaginative, original way. And McClelland sees here two major facets of his personality. His mother represents what we might call the primary process aspect of his creative personality, the intuitive, unstructured, fanciful thinking: his father the secondary, reality principle, processes of his life and work. The maternal side provides the interest in imagination and unstructured thought, his interest, say, in fantasy; the paternal side the desire to follow up these problems, to do research—in the same example, the work on coding and studying achievement-oriented fantasies. The paternal side is also seen in the administrative activities; his father, we remember, was a college president. So, while always somehow favoring the maternal aspect, he has realized the need to work on both levels, to achieve a synthesis, for neither alone is sufficient.

"Sense of destiny is a rather strong term for the way I feel. I have always felt very strongly about the importance of psychology, and the importance of developing better psychologists. I have a certain crusader's zeal about trying to recruit really good people into psychology." While still in college he was quite disturbed, as was McGeoch, by the fact that a very small number of the best students at Wesleyan went into psychology. He realized that, "unless more students, and the best that were around, went into psychology, it could never become really good." His missionary interests in this area are a contributing factor, I believe, to his willingness to participate in such committees as the Fulbright Advisory Panel on Psychology and the SSRC Advisory Committee on Fellowship Selection Techniques; as well as to assume the chairmanship of his department. It also relates, I feel, to his professional work on achievement motivation; in particular on the identification of creative talent, as in his book *Talent and Society* (1958).

"I have enjoyed being right about things in the sense that I have tended to follow a fairly offbeat path in psychology, and have done things that seemed a little crazy when I start them, and I rather like that. If I take a gamble in guessing that the level of n-ach in children's readers is going to be related to economic development, (and to non-psychologists that looks like a pretty absurd gamble, and even to conservative psychologists), and I invested five years of my life into getting the stories and coding them before I knew if it was going to pay off, and I was very nervous about it. But I can't honestly say I was really surprised when it did. You have to be a pretty good psychologist so you can know how something will turn out before you actually do it, and all the technique is so you can show the world something you already know is so. I get a lot of satisfaction in proving intuitively right in a gamble, I don't know whether that is achievement satisfaction." One part of this, I think, might be the satisfaction of carrying out in experimental form that would express the paternal side of his personality an idea which was intuitively correct from his maternal side. Also, in a way, doing what Hull would consider acceptable scientific research, on problems that would seem to be outside the boundaries of this science.

"I think I am a person who defines his ideas by rejecting other ideas. I reject the know-nothing school of behaviorism, Skinnerism experimental reductionism. I like to think I keep their precision, but I think they are working on trivial problems. On the other hand, I think I am clearly in opposition to the humanistic psychologists who like to talk in big global terms, and fear to get tied down to anything actual for fear that that will destroy their beautiful dreams. So I am in a funny position. I guess I have friends in both camps, but they both think I am a little peculiar. I can get along with Dorothy Lee, she likes me, but doesn't understand why I like numbers." He has a strategy for avoiding getting enmeshed in the organizational mechanisms of the APA which is relevant to this point. He has never joined any section of the association except the experimental psychology group. "I know those fellows will never elect me to any office."

"There is some enjoyment certainly of being an iconoclast, differing with most psychologists. Kind of refusing to get caught up in traditional ways of thinking about things. I enjoy controversy, I have a skill in debate; it isn't for serious [*sic*]. You don't decide truth by who is the most fluent speaker. I am often in opposition because it clears up, and clarifies your thoughts by knocking other people down, and other people's ideas, it helps define your own position. But my own standards have always been stricter than the standards of outside people."

"I have never been terribly interested in what other people think of my work. That's putting it mildly, I have never been the slightest bit interested in what other people think of my work. From the time I was 8 years old down to the present I have always wanted to solve problems for myself, and I have always been pursuing my own interests. I don't require the stimulation that some people say they need from their colleagues, I think that is overrated. I am always able to work things out on my own."

"My judgment has always been independent in the sense that I have always gone my own way, and I can't be pressured into changing my mind when I think I am right. On the other hand, I think that I must be socially very sensitive to what people are thinking. For example, I have always been aware of the fact, and it has annoyed me, that while I can keep on tune fairly well by myself, I can't sing parts in music. When other people are singing other notes I tend to deviate in their direction. So I guess you can't call that independence exactly, completely. I think I would say my differing from other people is more reluctant and deliberate, though firm, than defiant. There has been an element of defiance too, I suppose, in my attitudes towards psychology, but it's an intellectual sort of thing." Here too, the impression I received was that he felt that, in his terms, the maternal, imaginative side was independent; the paternal side, both in selection of problem areas within which the imagination is expressed, and in the systematization of ideas, is less independent and iconoclastic.

"Self-actualization? I don't know what it means too much. I have always been quite satisfied with my personal life, and very fortunate. I made a happy and successful marriage very young, so that I missed a lot of storm and stress on the security side, commonly associated with starting a family and settling down. I was always kind of a favorite child, my parents were less critical of me. I never really had any real problems in security. I belong, since my marriage, to the Quaker community and especially to my wife's family." This is a large, extended family of Philadelphia Quakers, living in close proximity, with strong filial ties. McClelland felt an immediate attraction and emotional attachment, especially as he was rebelling then against his own parents. He feels very close to his adopted family and religion. "I feel closer to my brothers- and sisters-in-law than to my own brother and sisters." In a sense, even in his professional life, McClelland has always been part of a community. As a child, he had felt close to the academic community of his father's college. Wesleyan was very much a small, warm community,

in fact it was his father's alma mater; and he later returned there to teach. Going to Harvard was a change for he had always planned to teach in a small college (and for that reason is still a bit unhappy at Harvard); but he had previously spent a year at Harvard, it wasn't a strange environment. We can see this even in his choice of graduate schools. He went to Missouri where McGeoch had been to study with a student and associate of his first teacher, and then to Yale where Melton had studied. He seems to have a strong sense of community (in Paul Goodman's sense) which is reflected in his social interest.

"Power needs. I have never felt that I had any, in fact, I felt rather the reverse. Power situations I have rather avoided. They don't bother me, I am not upset if I have to tell a faculty member that he can't have the raise he wants, or some research money, and I tell him. But I can honestly say I haven't been very much concerned with it. It seemed paradoxical to me that a person who cares so little, and I think it's really true, that I don't care for positions of power, that I should be asked to do it. I have never aspired consciously at any rate to any of these positions. I have always liked to get out of them as soon as I can, because they usually make me do things that interfere with things that I really would rather do. It's just that it bores me."

"I have always hated the word creativity. I don't know what it means, and I don't know what self-actualization means. Does it mean am I happy? The answer is yes, most of the time. Does it mean have I done things that I am glad to have done? Yes. I have been very fortunate, in my wife and children, family and friends, had lots of support from society. That just means that I have been living a good life, and been able to do the things I am trained to do. If you mean having ideas that other people don't have, I have always had my share of them. I think I get that kind of originality from my mother. As opposed to the more conventional kind that is more like my father, which might be related to writing rather than to ideas... There were no organizational pressures on me to publish. I have always felt that business has been greatly exaggerated. I never felt I was under the slightest pressure to publish. People once asked me why I wrote what I did, and the only answer is that I couldn't help it. In fact, at one time, it was embarrassing because I had published so much more than my colleagues."

"Peak experience, doesn't bring very much to mind, except when I have finally worked out a chess problem so that it fits together, after hours and hours of playing around with pieces; and it's neat, it works, and there is no sloppiness left over. An analogous peak experience would come, I suppose, when I have put in a lot of time on data analysis, let's say coding those children's stories, and it's a significant correlation. That's a very exciting thing. I had put a lot of time into it, I even liked to run the correlations myself, I suppose because I get the fun of seeing it happen right there. There is a lot of excitement in research projects, setting them up, organizing them. I like that kind of thing, and I am able to sustain enthusiasm over a long period of time."

"The third type of experience of this kind, I have mostly had abroad, the more sensuous types of pleasure from sights and scenes and smells and foods and sunsets and that sort of thing. I think I have had much more often in Europe, those kinds. Particularly the year I spent in Italy. [This was 1958–59, while writing *The Achieving Society*, and in the Preface he wrote, 'Italy (provided) the sense of perspective and of leisure, that in the end made the book possible' (1961, p. xii).] It seems that I have to get out of my puritanical, achievement oriented framework and culture in order to have these feelings. I have seldom had them here, although I did get the same kind of feeling from mountain climbing. It's a real effort to climb a mountain in the Rockies; you have to train for weeks to prepare for scaling the top. And to get there is a definite peak experience, literally."

"As far as life goals are concerned, I think they have been fulfilled far beyond what I really expected. I remember a session as an undergraduate, asking all the people present what they thought they would be earning 10 years from then, and what their aspirations were. And most of them were way above mine, in terms of what they expected to be and to earn. My aspirations were really quite simple, and I think they were honestly simple. I really wanted to teach in a small college. I am constantly surprised at the extent to which my life goals have been much more realized than I expected. I don't day-dream about things in the sense of tying things very closely to reality. I don't day-dream much except about things I can do, or about what can in effect be done. I think that my only wish at the present time is that I didn't have so much to do... During my sabbatical next year, I am planning to work on this economic growth thing, which I feel I should do. But, there is a chance I won't get the money I need. I will go to Europe even if I don't get it, but I won't be too upset if I can't do that work, there are so many other things I want to do."

The Achievement Motive

In tracing David McClelland's professional development we have noted the lack of a basic paradigmatic question acting as the pivot of a novel conceptualization of psychology central to his thought and research. In this he differs from all of our previous subjects. The problem areas were chosen either by the teachers he was close to, or, later, by the accident of having to broaden his scope in psychology. His first book, in 1951, was entitled *Personality* (1951), and is a text-book type of exposition in which he mainly applied the methods of thinking acquired in a training that was divorced from any real concern with personality to this new field. The majority of his subsequent work has dealt, in one way or another, with the question of achievement motivation. While the posing of the question clearly does not fit our definition (Chap. I, above) in that it did not involve the rejection of belief systems, and their replacement with new ones deriving from a paradigmatic question; I think we shall see that in the working out of the implications of

the problem, initiated almost accidentally, the question took on paradigmatic qualities and resulted in creative conceptual and methodological innovations. It never reached the point of being a focus for radical recentering. So while it is not of the highest order of creativity, as we defined it, I think it will be seen, on a less global level of concern, and in an unchronological sequence (in terms of our definition), to fit our concept of the creative process.

"Work on achievement motivation, how did this get started? The way it all got started was almost accidental, as almost everything I have done seems to me to be accidental. It just happened. The specific thing that happened in this case, was I gave a cocktail party at my house in 1946 [shortly after returning to Wesleyan] to celebrate the 50th anniversary of the founding of the psychological laboratories at Wesleyan, and invited also a Captain at the Submarine base in New London, Connecticut. In the course of circulating, I stopped to talk to him, and he said, 'Why don't you do some work at our research laboratory?' I said, 'that's absurd, that's not my kind of work.' I was thinking of work on the relative effectiveness of various color flares and such. But he said that wasn't really what they were doing, and that he had some money for research. Then, it just happened that Jack Atkinson [an older, war veteran, student at Wesleyan and a close associate and co-worker of McClelland's. The first book on achievement motivation (1953) was in collaboration with Atkinson, among others, who is now a professor at the University of Michigan and has continued to work on this subject.] was talking to me, and he had not gotten very far along on his senior thesis, was due to graduate February 1st, and needed to earn some money before graduate school in September; and he also needed more time to work on his thesis. So, I called this Navy guy and asked him if he could help out. He said 'sure, we will work something out.' That was the beginning of the research on n-ach. There was a financial motive in starting it, and in finishing it. I always had about 6 or 8 projects going, this was one of them. There were quite a few others. In this case, we knew if we kept to pretty much the same things, we could continue to get this money. So this kept a series of students over the years working on essentially the same project. It began to get cumulative, because we had so many people working on it."

"Our first task was to get a method. We were interested in the effects of hunger on fantasy, but then we shifted quickly to n-ach. We chose n-ach because it was a variable that Sears had worked on (even though while at Yale I had never worked with him), and I had worked with it; we knew how to ego-involve people. We were simply interested in comparing the fantasies of people who were ego-involved with the fantasies of people who were not ego-involved."

"Well, that involves a number of variations of atmosphere, looking at the protocols and deciding how they differed from each other, and developing coding systems for discriminating between them. A very simple straightforward coding system for discriminating

between them. A very simple straightforward thing. Except that I was committed earlier to leaving the judge out of it as far as possible. I objected now, and I objected then to rating scales because they include so much of the judge's personality. Obviously this required a lot of refinement, a lot of creativity and originality in trying to discriminate the stories, between the two things. You could do it globally, by ratings, clinical impressions; but we were trying to define it more precisely. Well, this meant a long period of cut and try, and we repeated the experiments after we had the coding system, and changed coding definitions, threw out coding definitions because we couldn't get two judges to agree at 95% accuracy. It was a great task."

"Once we had a scoring scheme, we asked ourselves whether people who thought a lot about this behaved in different ways, so then we got an individual difference measure, and began correlating it with everything we could think of: Rorschachs, performance scores, and so on. Then we moved out and fanned out in all directions. That seems to be the next step."

"Another step was: well, how did people get that way? Are people with high n-ach different from people who don't have much of it? What about their family backgrounds? So we went and studied origins."

"Then we got interested in the relation of n-ach to different types of cultures, different types of societies. And that's how we moved out into the world. We wanted to ask, what are the people like in the world who have a lot of these characteristics? It seemed that they were the ones who played the entrepreneurial role. Is this just in the West, or is it in the Communist world too? Was it true 10,000 years ago? We were just following our nose in all directions. There wasn't any sort of concerted plan of attack, we sort of were answering questions as we went along that obviously seemed to need to be answered."

"That year I was at Harvard I read Max Weber for the first time. I read his book on the Protestant Ethic, which struck me as a really seminal book, full of interesting ideas. And I noticed the similarity, obviously, for the first time between the kind of person he was describing and the kind of person I'd been studying for 3 or 4 years. And, again, I don't think it took any great originality to notice the similarity. The words he used were almost the same. So then I made contact with this whole other tradition in sociological theory about how this class of entrepreneurs really created modern capitalism, and the spirit with which they went about it. From then on out it was a simple question of checking to see if this idea was right, and most of our ingenuity and efforts were directed to trying to find ways. And then, of course, it became clear that once we saw Weber's historical case, as a special instance of a much more general phenomena, namely high achievement motivation, we could find it in all different times and places around the world and in history. And we were forced to invent techniques of measuring n-ach in people who were dead, scoring popular literature, and so on. I would say that what is obviously different about this is that while many people might see the connection, there is a long

way from there to proving it. Most of my energy, obviously, has gone into an attempt to prove that, or subject to some kind of objective test to see whether it's correct and to what extent."

"The last stage, I am in now. Having demonstrated to my satisfaction that these waves of achievement concern for whatever reason, in various times and places, are associated with increased entrepreneurial activity and rapid economic growth. Then the other side of my interest comes to the fore. Mainly, if you really understand, if this really is a factor in economic growth, why can't you change it? Why can't you increase n-ach where people would like to have rapid economic growth? Obviously one of the major problems of our time is underdevelopment all over the world."

"It dawned on me that maybe we could develop n-ach. Well, here I have two obstacles to overcome. Namely my conviction that motives of this sort really were laid down in childhood, and that it's highly unlikely that you could do much to them in adults. And yet, again, necessity is the mother of invention, as is always the case in my life. Well, I can't do the research if I believe those convictions, so I can't believe them. I've got to find some way of changing motives in adults. And this brought me back to my earlier interests in learning anyway. I am now working in the field of adult learning, but with a whole new set of variables. [The reason for his abandoning of learning, was McClelland's realization that the variables dealt with in the McGeoch-type research, such as he had been doing, had been pretty well worked out.] These are new variables, which haven't been played out, motivational set, setting variables. Now I am involved with what I call change-research activity. How to create achieving societies. As an experimentalist, I don't really believe in a phenomenon until I can produce it in the laboratory. Now I want to get in on the ground floor in a country and do just that... So I will be traveling all over the world, trying to develop n-ach, in management training and so forth, and spur economic growth. In a way this is very grandiose, my feeling that I can change history in this way; sort of like Alexander the Great going out to conquer the world."

Before leaving the subject of the contentual [*sic*] nature of the research, I think it is relevant to quote from the preface to *The Achieving Society*:

> This book grew out of an attempt by a psychologist, trained in behavioral science methods, to isolate certain psychological factors and to demonstrate rigorously by quantitative methods that these factors are generally important in economic development. The scope of such an enterprise turned out to be truly alarming for one whose background in the social sciences was slight to begin with. It required specialized knowledge on everything from population problems, to coal imports in England from the 16th to the 19th century, to methods of computing rates of economic growth, to sources of children's books, to management practices in Russia, Italy and Mexico, to the pottery of Ancient Greece and pre-Incan Peru... in the search for the broadest possible test of the hypothesis that a particular psychological factor—the need for Achievement—is responsible for economic growth and decline... But how did I get involved in covering so much territory in the first place? Why risk being superficial? The answer lies in the general methodological approach of the book, which is in the tradition of comparative history, comparative economics or a psychology interested in generalizations that apply to all or most of the human species. In other words, the book attempts to answer general questions, not specific ones; it does not probe the particulars of the Industrial Revolution in England but examines the factors underlying that

> revolution which were common to other such waves of economic development in history... I am by profession a clinical psychologist... (and)... It is perhaps because I have spent time analyzing particular cases that I feel the need for generalizations and a comparative frame of reference... Though it is not my purpose to deal with (particular) cases, it is my hope that the generalizations established will help in the analysis of particular events in history, in exactly the same manner that the generalizations of a physicist help an engineer to design and build a bridge in a particular spot at a particular time (1961, pp. vii–viii).

I think we have here a clear, retrospective, systematic presentation of the aims of this work, which outlines the reasons for its forms and scope, even though we have been told that the development was not nearly so premeditated. This is a position somewhere between Rokeach and Simon on the one hand, for whom the following up of the implications of the initial problem proceeds in clearly planned and premeditated stages, with everything seen in the context of the whole, and Maslow on the other, whose research tends to be the following of an intuitive problem, without realizing the implications in terms of the whole until it is finished. (I might note, that I find no justification, either in the interview-data or his writing, for McClelland's self-description in the above passage as a clinical psychologist. The work on motivation does not, to my mind, constitute clinical psychology [notwithstanding its concern with personality.]) What light can McClelland throw on this work, besides the history of the ideas?

"I don't really think that what we did is terribly original, except in the technique, and the perseverance with which we followed certain ideas. I know people who have had 20 more original ideas than I have had, and I think that this is a simple idea, pursued to the ultimate ends of the quest of knowing what the achievement motive is all about. And, as I say, this was partly for financial motives as well as creativity. This is the active part of creativity. One-tenth inspiration, nine-tenths perspiration. One little idea, pursued in all directions, until it was thoroughly worked out." Yet it is with this "little idea" that McClelland now hopes to change history. A rather large oak tree has grown over the years, with many branches and off-shoots.

"The information came from everywhere. I have a very wide-searching technique for getting information. I read widely, in all kinds of literature, in 6 languages. I read everything. I try to explain to my students that if you're going to be a good psychologist, you never know where your ideas are going to come from, and you've got to cast a wide net, particularly if you are in the field of personality. I got the basic idea for coding the factisies [*sic*] of need-affiliation from some of the imagery of Shakespeare's Sonnets. My views on design and execution I got from the Yale tradition."

"I can't say too much about all of these [Chap. II, IV: A–D] except that all of these things occur. My feelings about it, that it is a strange mixture of ideas that pop into my head as important, and get sorted away someplace as important, and somehow pop out again at a moment when they are useful. And I never know where I pick up these ideas, but I have a great selecting mechanism. That is, I scan a large amount of information, but unlike some people who really get loaded with material, I throw most of it out. I

can read a whole book and retain only one idea. So that my mind isn't too cluttered up; I have a great way of throwing things away."

"The ideas come in when they are useful to me, thought is somehow always connected with action. Almost any research problem has had some practical element in it to be solved. Like a graduate student need, or ability. A lot of my research interests have been dictated by the particular needs, and the special knowledge and abilities, or particular individuals who walk into my office at a particular time. The instance with Atkinson is only one of many."

"I think of myself as intuitive and experimental rather than rational and logical. I am irritated, and may have gotten this from being associated with Hull to a certain extent, this business of mathematical-deductive, logical systems. It all seems very pretty to me, but that this is a kind of gamesmanship, and not really related to the real world. I am impatient with logical, I always hated logic. I am very devoted to reason, to careful reasoned argument; but that seems different to me from Euclidian geometry and stuff like that."

"Typically, the side of chess that I was interested in was fairy chess, which is a kind of chess where you break all the rules of the game, invent new pieces, new moves, work with three-dimensional boards, boards that go around in a circle, and so on. I talked to Herb Simon [a good contrast here!] about this, and he had never even heard of fairy chess! I think his mind is a more logical and orderly one, probably, than mine is. Mine would be more interested in new moves, new types of games, rather than the other. But there is a mixture here. On the other hand, I love tables. I spend hours reading statistical abstracts, where things are laid out neatly, orderly. That's not the same thing as logic. I hate to be forced to a conclusion by logic; I don't mind being forced to a conclusion by the data."

"The achievement work, I was just doing whatever came up next. I was following my nose. I never made any logical, sensible, theoretical decisions that I remember. The steps all seemed kind of natural to me. Although later on Paul Lazarsfeld wrote up a great thing about how systematic our search into motivation had been. He utterly astonished me! I heard him lecture on this, and it was so orderly and rational what we had done, and I hadn't the slightest idea. That's what I was doing, but I certainly didn't go about it that way, it turned out to be that. I would also be, I think, a combination, again, of my mother—fantasy, the achievement motive stories, humanistic feelings, etc., and my father—careful, rigorous work, Hull experimentation. These must be combined, not opposed."

"Collaborating for me has been a very special kind, I guess. I have always worked with students. I suspect that this has meant, not that these students don't have ideas of their own, they do; but it still means that they have to work within my framework. That's clear. I can't imagine myself collaborating with Fred Skinner, even though I respect him,

or Harry Murray, who is closer, but insists on using judge's rating scales. There are basic assumptions in collaboration, or you can't work together. And my students obviously share these assumptions or they wouldn't be working with me. The collaboration has almost always been one where I lay out the kind of general nature of the problem, and help most at two points. One, especially in fantasy research, I help critically at the point of defining differences. That is, developing coding systems. Which is to my way of thinking extremely creative, the most creative thing I can do, what I do best in psychology. I have done this dozens of times; am able to do it at the important middle level of generality, not too picayune, and not too global. It's convenient for me to do it. The students collect the protocols and I take them home and work out the variables. They also work on this, and we go over it together. They nearly always run the experiments, collect the data. And then, the amount of data analysis that I do varies somewhat, but I have a real passion for doing data analysis, preparing graphs and tables; and very nearly always I will write up the paper also. So that most of the papers that have my name along with several others have been written by me. And the students have worked with me in designing the experiment, and they executed it. In a way the nature of my collaborations has changed over the years. I haven't changed, the students have. Students are much less interested, or willing to collaborate with me now that I have reached a certain standing, in the way they were 15 years ago. Now they feel that in the world's eyes, though not in mine, if a paper appears with my name along with that of a student, it will be thought that it is really my work, my ideas. Which isn't true, and I don't think so; but this feeling exists."

"Writing started out by being extraordinarily difficult for me. I wrote a paper as a graduate student which I had an awful lot of trouble with. I wrote it over eight times. I kept at it because of the things I wanted to say. I felt they were important, and people should know what the truth was, that I thought I knew. I had a certain compulsion to say things but very great difficulty in learning how to do it. Later, I don't know when, the process was so agonizing; to produce an article might take a solid year, and literally one hundred hours of work to get twenty pages. I slowly began to get a little better, but I had this 19th Century style. I blame my father for it, he had influenced me that way. He thought that Macauley and such had the only good style, and influenced me in developing this style. But at some point I just decided that I didn't talk as dully as I wrote, and in such an intricate, involuted way, because without seeing them in front of me, my sentences couldn't become so long and complicated. So I decided to try and dictate my first drafts, and started that with my first book, on personality. It took quite a while to learn to dictate, but I had had that administrative experience during the way, when I dictated memos and such. So I found that my spoken style was much clearer, simple and straightforward. Because my memory span is so poor I had to keep in mind what I said, and I couldn't do that if the sentence was too long. I still can't write on the

typewriter to this day. Although if I trick myself by not looking back over anything I've written, I can, otherwise the sentences get very long and complicated. Writing for me was simplified by having a secretary. Editing is very simple, once I have a first draft. Now I can produce an article of a non-technical nature in four hours."

David McClelland, I think we can say, started out accidentally on a problem in measuring fantasies, began without realizing to evolve a line of research and inquiry based around the general question of why do people have a need to achieve? This became, I think, a paradigmatic question with numerous significant and creative sub-problems. The questions, how can we measure n-ach? How does it affect fantasy? were the initial ones. Answering these led to the first major methodological innovation, McClelland's way of developing coding schemes to analyse fantasy material in a rigorous fashion. This, he says, "Is the most creative thing I do." The next question, what are they like, the people with high n-ach? led into many areas, most importantly it led to the question, what produces high n-ach? individually? culturally? The extension of the inquiry to social spheres was the second major creative leap. It was at this point that he encountered the Weber thesis. And by this point he had already evolved enough of a paradigmatic viewpoint in this work, so that he immediately interpreted Weber in terms of his system. He was the first, to my knowledge, to make the important leap of viewing the Weber thesis as a specific manifestation of a general, paradigmatic, phenomenon. A structural rather than a merely contentual [*sic*] understanding. And once more a methodological leap, for now he applies his coding methods to cultures, past and present, to demonstrate the general validity of the thesis that he shared with Weber. And then the third creative leap. Having slowly generated a paradigm which afforded a vantage point from which to view all of economic history, generalizing from his work with individuals, and from his establishment of the Weber-type thesis, he makes a conceptual and methodological jump in deciding to try and carry out the theory in practice, to create on a social scale the phenomena around which the theory was built. This is possibly his most novel creative innovation.

For this reason, although it is clear that his work doesn't exactly fit much of the first part of our definition, I think that it did in actuality, if unconsciously, evolve a paradigmatic view, and folllow up its significant implications, generating novel heuristics. The paradigm, especially in its final stage (although we can speculate on the influence of a radical Protestant family on an interest in achievement motivation), reflects a deep personal involvement with community, society and the social interest. The paradigm is really a general one only in its generation of a novel view of society, and social change. In the realm of psychology it did not effect a restructuring, and was never meant to. To do so would have been inconsistent at least with McClelland's conscious concept of the value of scientific work. To use the personal analogy once more, I would say that the paradigmatic aspects are expressive of his maternal side, the views on the nature

of science of the paternal, and they come together in the actual doing of science and imaginative inquiry. I will end this study by quoting McClelland's view of the role of psychology as a science, as distinct from his responsibilities as a member of a community and society.

"One thing that has bothered me, believing in science the way I do, is that people have been relatively indifferent to accumulating bodies of evidence of a commonsense sort. As opposed to the Great Man theory of psychology that it is easier to make a splash by being a Skinner or a Goldstein or somebody who has a distinctive view on personality or psychopathology. You get argued about, books written about you, you get taught about. Hall and Lindsey, in their book, talk about people with these points of view. About me they say, 'He is so eclectic that he isn't interesting to talk about.' Well, this kind of indifference doesn't bother me personally so much, but rather from the point of view of science. My view of psychology is that we should be accumulating information about important areas of personality. I was naive enough to think that the day of schools in psychology was over. But I have learned that I was wrong. Because I think it is much cheaper to argue about great big viewpoints, which really doesn't interest me very much. On the other hand, I am also not interested in the gathering of trivial detail for its own sake. There is that important middle level of relevance. My ultimate view of psychology was that it would be, eventually, like a textbook on physiology, with chapters on various subjects, and a lot of dope in it."

Chapter VII: Jerome S. Bruner: Thinking, Learning, Knowing

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Jerome Bruner, one of the youngest subjects, also had one of the quickest rises into a position of recognized standing in his field. Currently Director of the Center for Cognitive Studies at Harvard University and member of the faculties of the Department of Social Relations and the Graduate School of Public Administration, he was one of the youngest men to attain the rank of professor of Psychology. His considerable productivity has been in the areas of propaganda analysis, opinion analysis, perception, thinking and concept attainment, learning and the process of education. In his case, as in McClelland's, there is no immediately identifiable central, paradigmatic question unifying his research; and this is one of the problems we shall be taking up in the following study. He has written many articles, and, alone or in collaboration, four books. Also, like McClelland, he has been a more frequent participant than the other subjects, in administrative and advisory activities. He is currently President of the New England Psychological Association, and President-Elect of the American Psychological Association.

The interviewing for this study was in two parts, The first, on August 13th, 1963, lasting for an hour, was unrecorded and largely unstructured, taking place at lunch. The second, formal part, took place under the crowded schedule of the academic year, on October 29th, 1963, and was unfortunately limited to one hour. The material, therefore, is both limited and less structured according to the outline than the previous chapters. The presentation of the case-study will, therefore, suffer from the same limitations of scope and structure.

Growing Up: The Process of Education

Jerome S. Bruner was born in New York and grew up in a Long Island suburb. He had a half-brother 14 years older than himself, and a younger sister. His father, an intellectual, professional man, was also a deeply liberal person, and this impressed young Bruner very much. A conscious realization of intellectuality, however, was a slowly evolving aspect of his identity.

"Very early in life, I had no particular self-consciousness, about goals or such, wanting to be an intellectual. It never occurred to me that there was such a thing, or that there wasn't such a thing. I came out of a liberal Jewish background, with a lot of professional people, and there was no discontinuity between the world of using your mind and the world of anything else. So that in a kind of inchoate way I sort of took intellectuality for granted."

"Yes, I see now that there were certain kinds of things that were inducements to observe and think. I come from a curious split-level family. I have a half-brother who is 14 years older than me, so he could do lots of things with me. I remember my brother and I frequently went into New York, to the Museum of Natural History. And, as early as he could get me to do it, we used to have games. When he got home he would ask me to write up things, usually things like 'Why the Dinosaurs disappeared.' The nice thing about him was that he seemed to get pleasure, not so much from my getting things right, but just in the exercise of the process. There and in other aspects of life, I think the use of knowledge, the use of mind, that kind of thing, were never anything terribly strange. Nor was there any great separation between what we now call the two cultures, the world of science and the world of literature and art. I think this is one of the benefits of being a Jew, among many. There is a kind of pleasure in process, the process of doing things was always more important than the product we ever produced. And this was true of the games and activities that I and my friends pursued as children."

"I had a dream as a child, that I remember very well, that I think is quite indicative of my state of mind then. Part of this I know from analysis. The dream was that everybody in the world had died, disappeared somehow, they weren't there. But there were a lot of other people there. And I was somehow in a position of having to know, having to tell—they had never seen anything in the world—having to tell them about the things that had been there before; and it was a terrifying dream. I think it must have to do with the fact that I was born blind; and living my first two years blind made, possibly, some kind of compensation in the opposite direction, of wanting to know. Knowledge somehow is what gives you control of the world, knowing what was there."

Having this kind of intellectual curiosity and the need to figure things out by himself, it is easily seen that Bruner might have had a difficult time in public schools as they are usually constituted and staffed. This is what happened.

"My first school years were rather trying, I just couldn't understand what in the world they were after. It wasn't that I couldn't do the stuff, but that I couldn't for the life of me understand why anybody should want to do these things. I remember being left back in the first grade—until I managed to start learning in the way they expected." After that he never had any real difficulty in school, but was always dissatisfied with the form and content of the education he was receiving. He always did well scholastically, but his real interests were not those dealt with in his studies, up to and into college. "What you were doing in class was never as interesting as what you were reading on your own; and what you were reading on your own, then, were novels and so forth." But still no consciousness of an intellectual separateness.

"It wasn't until freshman year in college that I realized that some kids didn't understand things that seemed so simple to me." His roommate was an athlete who was very bright scholastically and helped out other athletes in their work, and Bruner joined in and started tutoring some of the athletes. "They were very nice and unassuming, humble, and anxious to learn, but they just were not as bright as I was." And it was here that it occurred to him that what was clear to him, and obvious, need not be generally so. This was an important recognition.

Bruner went to Duke University, then undergoing a great efflorescence, without knowing what he wanted to study. He toyed with economics, but a course on insurance finished that quickly. It was after that that he got on the ultimate path of his intellectual development, and here, too, the process was indirect.

"I acquired an interest in biology, took courses, did lab work and so on. During the summer I read a lot of anthropology. The next summer I took a course in experimental psychology at Bar Harbor, Maine. And it looked like a career in biology. But, along the way something funny happened. I had developed some strong convictions about compulsion and freedom and that sort of thing. What it all came to center on was compulsory chapel. I just didn't show up for compulsory chapel, whereupon I was expelled from Duke. There was a certain amount of furor about this. Partly because the Deans were a left-over from the old regime, conservative, while the faculty was new and more liberal. And a little earlier I had made some trouble. Some of the students were going to establish sort of a voluntary society, an honor society, and they were to be a secret group who would report on other students. I thought this was simply ghastly, and I wrote a piece for the student newspaper about it. This got the deans mad, because they were for it; it was to be some kind of administration secret police. Horrible thing. So when I didn't show up for chapel, they expelled me. When I was dismissed, word got around. And MacDougall, who was there then, went to the dean and pleaded my case. He said I could come and work in his laboratory during the compulsory chapel hour. And they agreed. This got me into psychology, and from there on in, that was it."

"For me, interest tends to go where your competence is. As you build up competence, and the technique to make good on the competence, you find yourself going in that

general direction."

"After graduating I came to Harvard to work with Lashley. And while it was not a great department at that time, it had a brilliant collection of graduate students, and we gave ourselves a pro-seminar. And it's a group that has remained very close friends over the years, and all of them have done interesting things in the field."

It was at Harvard that Bruner began to work on the first of the problem areas that have been important in his professional career, and we shall be concerned with these in a further section.

We have seen the development of an inquiring, intellectually curious mind, that was influenced by teachers and courses, but not really molded by them. The fundamental traits had been formed early, in the faculty situation, and the contentual [*sic*] developments occurred around, but not modifying this essentially independent structure.

Personality

"Achievement motivation? I'd like to make a difference I suppose, in my generation; that there be a difference because I lived. I suppose it is the kind of thing you get in people who are willing to get into a profession in which the main thing that you do in this odd profession is after you finish one thing in which you become the master, is purposely put yourself in another situation where you are dumb. This is the great challenge and the glory, but it is terribly exhausting. I enjoy the iconoclast role. I don't feel particularly prophetic or messianic I guess." We might be able to identify some element of a sense of destiny in the dream he recalls from his childhood, of having to tell the world about all previous knowledge. I think this is expressed, if unconsciously, in his current work on education, starting with *The Process of Education* (1960), in which there is a definite aim to improve society by improving the quality of education in our schools.

"Self-actualization, creativity? Do I feel as though I am using my furnace? Yes, very much so. I sometimes feel that my great problem is that I over-extend myself, over-actualize myself by making more commitments than I can fill. And I am struck by the fact that there are so many happy accidents, and unhappy ones, along the way."

"Peak experiences. I have them in research, when I feel I really understand something, and can share it with some people; this is a marvelous experience, it really buoys you up. You've got there finally, and you understand it. When you think you have a simple model that is going to render things that were terribly complicated, suddenly simpler, it really has, itself, tremendous energizing properties to it."

"Teaching is a curious peak experience for me. I had a year without teaching, at the Institute for Advanced Study, and that's too much to give up. First of all, you can't be productive that much during the day. And you can't be productive outside some sort of a dialogue, and I find the dialogue with students makes me tremendously happy, makes

me the chief beneficiary, by making things clear to myself. I get tremendous sustaining feeling out of teaching. I really wouldn't do without it."

"I lead a life filled up with things. I do a lot of things, and in consequence, perhaps, over-commit my energies. So I have to get away. First of all, I have to be alone by myself for at least a short while during every day, otherwise I can't stand it. And then, I have to get away in summers, say, for a period of time. Fortunately, my wife and I both enjoy sailing, and we get into our sailboat and just drift off-shore for days. This is important."

"I enjoy painting, but don't get enough time for it. We work so much with words, that I don't get enough of a chance to do that, work with my hands, so that I don't feel requited fully. I don't get enough chance to use my 'left hand' (cf. 1962), the world seems too much with us [*sic*]. But I suspect this may have to do with the age I am at, the late 40's. I am committed and asked to do so many things. And even those I feel I really should do are too many. I have a feeling that if I wait a few years some of the irrelevant things will probably drop off. I find that the work you are committed to you return to, you go on with."

"I work all the time. I find even when I go off and am entirely on my own, I come back and what has happened is that the thing is farther along than it was. So my unconscious must have been working at it. There are moments when I have a big insight only to find that I'd said the same thing in some previous memo, only hadn't understood it. So that it is a little bit like a seamless web. I also work at experiments in writing. I care about the English language, I wish I could write it better. I suppose I go through more drafts than anybody else."

"Friends are very important to me. I have been very fortunate in having many close friends you might say that I am given to close friendships. And this has always been an important part of my creative processes." At one point Bruner worked with a group of other thinkers on a project for the State Department, under Acheson. That group became very friendly, and formed a dinner-club. "We have dined together every Friday night during the year for the last 15 years. It's an interesting group: Wassily Leontief, the economist; Edward Purcell, the physicist; Finland; Peter Wulf, the Byzantinist; Myron Gilmore; George Homans; Kingman Brewster, now President of Yale; McGeorge Bundy; Jay Stratton, President of MIT. It has been an interesting kind of thing, in that the group has never had more than informal dinner and conversation. We have brought in outsiders, various people when they were around—Robert Oppenheimer, Ernst Gombrich, and others. But it has been essentially the same core, it hasn't changed much. It has always been an occasion in which people were talking about the areas in which they found most novelty, within their own fields. And I can't begin to tell you what an important thing this colloquy was. Oh, a lot of times we start talking politics, and a lot of things get done within the conclave; but, in general, it was talk about ideas. And I think it has formed all of us in quite an important way."

The Evolution of Concepts

During the years before and just after the start of the Second World War, Bruner, a graduate student at Harvard, became interested in the question of propaganda analysis. He went to Yale and worked with a group of people, under Leonard Doob, who were investigating this area. After this work he wrote his doctoral thesis on a problem in propaganda analysis, and this brought him into his first sphere of public service activity. After the thesis, he went to Washington and worked with the Intelligence Services on propaganda analysis, eventually going to Europe on intelligence work.

After the war he returned to Harvard and took up his researches again. "I think the post-war period tends to be more systematic. I came back struck by the fact that human beings don't form attitudes and opinions on the basis of looking at reality, and the forming a view. But rather, what has a tragic cast about opinions and views, is that they determine the way you look at reality, at the world. And so there is selectivity, the world comes to conform to your expectations. So we worked, first Bob White, Brewster Smith and I, on a study on the roots of opinion in personality. We wrote a book called *Opinions and Personality* (1956)."

"We finished that and I found myself still dissatisfied. I found myself wanting to look more closely at the process, the function that opinion serves in a personality, to keep the world on an even keel. And started studying perception, dusting off an old technique, using a tachistoscope. Being very impressed with the extent to which needs, what the French call professional deformations, affect the manner in which a person looks at his world. I published a whole series of articles on that, many together with Leo Postman. But as I went along it was also very clear and apparent that this wasn't telling the whole story."

"I was watching my own children grow up. Psychologists don't often write about this, but it was terribly suggestive. It is an extraordinary thing to see. As children grow, they begin to get these models of the world. And that makes it possible for them to spin the model a little bit faster than the world goes, and do some predicting. And there is an extraordinary rationality in it as well. The first thing that struck me was that they go beyond the information given, they are not just stuck there. They have enormous powers for interpolating, extrapolating and predicting."

"I used to take my son to the Peabody Museum at Harvard on Saturday mornings. One time we saw a display-case with a model-scene of some Indians, one of whom had a baby in swaddling clothes on her back. My son asked me what the swaddling clothes were for. I said they were for warmth, and I suspected they had some ritual importance. And he asks me, 'Doesn't it do something to them?' So I told him about the theory Geoffrey Gorer had, that the frustration of the binding clothes tended to make the Indians more aggressive in later life. My son asked me, 'Do you believe that?' And I

told him that I didn't know. Later on, that evening, we were discussing why milk froze in the winter, outside. And I explained why the lid had to be able to come off, if not you'll break the bottle. And I told him how you could check this, by clamping one, and leaving the other open. And then, when I was putting him to bed, he said, having gotten this paradigm for checking: 'Couldn't you find out about the swaddling clothes, if the theory is true, by taking a couple of kids, and only binding some of them on a binding board?' I was impressed with how quickly kids pick up these techniques, for sorting out information and using it."

"I became impressed also with the fact that our perceptual readiness also reflected some powerful principle whereby human beings and probably organisms in general attempt to maximum gratification but also to minimize surprise in their environment. And it was minimization of surprise in the model building aspects of the thing, that made me very, very receptive when the Shannon and Weaver book on information theory came out; and I got to talking about these things with George Miller and we explored some of these things."

"And then, fortunately, and there have to be breaks when you can rationate [*sic*] and get away from it, they have always been extremely important to me. I have very, very strong introversive tendencies, although I have an extremely misleading social facade. At this point Robert Oppenheimer [whom he had met in Washington and become quite close to] invited me to the Institute of Advanced Study for a year. And there I had a chance to think a great deal about these things. The extent to which behavior is so beautifully adapted to the environment and to our own capacities. I knew also that the neurotic manifestations of primary process were part of this all. I was in analysis, as a matter of fact, at the time."

"I had a chance during that period to talk to John Von Neuman. He and I set up a supper club down there, like the one up here. I think it has been an important thing in keeping me from getting too much imbedded in my own work, and it has been a diversion, too. Von Neumann, myself, Panofsky, Pies, Plotchek, and various others from time to time. The talk was very much in terms of a kind of epistemological crisis, I suppose, in a sense, the crisis of the intellectuals in the 19th Century had to do with the relationship between values and knowledge. I think in our time the crisis really has to do with understanding the nature of knowledge itself. I became intrigued and gradually found myself attempting to build some kind of model of the way in which human beings adopted strategies for getting information, in order to form concepts. How these models were built—concepts which stand for the world."

"I came back, and we worked for several years after that, seeing if we could study the systematic nature in which people picked up information, and that led to *A Study of Thinking* (1956). These things always have a way of running one thing into the next." In the preface to this book, the problem dealt with is set forth specifically:

> This book is an effort to deal with one of the simplest and most ubiquitous phenomena of cognition: categorizing

> or conceptualizing. On closer inspection, it is not so simple. The spirit of the inquiry is descriptive. We have not sought "explanation" in terms of learning theory, information theory, or personality theory. We have sought to describe and in a small measure to explain what happens when an intelligent human being seeks to sort out the environment into significant classes of events so that he may be able to end by treating discriminately different things as equivalents (1956, p. viii).

The next step was one that emerged slowly, from this study of basic cognitive processes. There was first a realization that certain things needed to be fitted in, dealt with. An interesting incident which contributed here occurred at Princeton.

"One day I came by to pick up John Von Neumann for dinner. As I was waiting for him to finish up some work, I noticed that he put something away in a large drawer full of pieces of paper. I asked him what they were. He said, 'These are the things which I know but don't bother to prove.' " This raised a number of questions about knowing and learning that were outside the scope of the book. A few years later, driving his son to boarding-school, they were talking about school in general and it occurred to Bruner that if you thought you had a decent theory of learning or concept attainment, it had to imply some kind of theory of education.

Another important realization grew out of the research on concept attainment. It was clear that there was a clear pattern of development in the capability of arriving at a concept. There was some kind of optimal pattern of concept development, that would both maximize gratification and minimize surprise, while still allowing, as he had seen with his children, the persons to go beyond the information given.

"I thought maybe we had overshot in the other direction. And I wanted to show where all this systematic stuff came from, and I became interested in children, child development. I started studying children, which I have been involved in ever since."

But this was not yet going beyond the limits of the problems as formulated in the thinking book. It was only a little while later that this new area was restructured around a new problem, namely that of education. And while this was not unheralded, we have seen some seeds of the new departure, the spur that started it was an external, almost accidental one.

In 1959 Bruner was vacationing in Colorado, and planned to spend the summer there, resting, and working out some ideas. But this did not turn out to be the case. "I got asked by the National Academy of Sciences if I would run a summer study of the process of learning, and I said yes: semi-reluctantly, because there were other things that I wanted to do. And from there on, I find myself sort of up to the ears and terribly committed to the business of seeing what can be done by reforming the curriculum."

Bruner's interest in the process of education was motivated not only by its relation to the problems he had been immersed in up till then; it also was personally very relevant in two important ways.

"I think the idea of reforming the curriculum has a lot to do with what I think learning would naturally have been like for me, if it hadn't been interfered with so often by the curious institution of the school." The troubles he encountered in his own education

were ones he could now readily understand in terms of the defects of existing curricula and methods in utilizing the natural learning processes and the natural curiosity of the child. Bruner had in this a rare opportunity for a kind of retrospective compensation for the difficulties he faced as a child.

"My feelings, such as they are, of lack of success as a father, and I feel I could have been much more successful, comes from a failure not to intervene, to hold off your opinions. However much you try, I have the feeling that a great deal of growth consists of children trying out techniques, trying to assimilate things to their own way of thinking and trying them out in practice. I sometimes think it would be an interesting kind of thing, if you take another set of kids through life, and try that again. They are a special kind of product, that's very difficult to define, different from anything else that you do." Bruner has had this opportunity, in a sense, in two ways. In his second marriage he "acquired" five new young children, sort of another chance to bring up children. And, in his work on education, he is doing this on a more detached plane. "You can't help influence your children, I don't know what the right way is. I am not at all clear on the parental role; except insofar as the parent is a figure for identification. And, probably, identification is the most effective technique we have for teaching anything. Because what you do is to provide a set of ways for doing things which then catch the person in it."

> In September, 1939 there gathered at Woods Hold on Cape Cod some thirty-five scientists, scholars, and educators to discuss how education in science might be improved in our primary and secondary schools... The intention was... to examine the fundamental processes involved in imparting to young students a sense of the substance and method of science (1960, p. vii).

This was a reflection of a general movement, which, though young, was already widespread in America, spurred perhaps by the dramatic impact of the Sputnik in 1957, to effect revolutions in the design and content of scientific curricula. But within this general movement, the Woods Hole conference was a new step, unique in the composition of the group, and in a primary concern for the structure rather than the content of the new curricula. Jerome Bruner was the director of the conference, and chairman of its executive committee.

> Virtually all of the curriculum projects (alluded to) earlier were represented by scientists who had been engaged in the process of writing texts, teaching the new courses, or preparing films or other materials. In addition, there were psychologists who had devoted a major part of their research lives to the examination of intelligence, learning, remembering, and motivation. Strange as it may seem, this was the first time psychologists had been brought together with leading scientists to discuss the problems involved in teaching their various disciplines. The psychologists themselves represented a wide spectrum of points of view—behavioristic, Gestalt, psychometric, the developmental viewpoint of the Geneva School, and the rest. The differences, however, paled before the issues that were to be faced. The group was leavened by a representation of professional educators—teachers, deans, experts in audio-visual methods. Two of the Conference members, finally, were historians (1960, p. x).

After the opening sessions, and some demonstrations of various methods of mechanical techniques, the conference split into five study groups. Each group eventually submitted a lengthy report to the conference for debate. The five groups represented a broad

spectrum of interest, for our purposes we shall note that three of the topics (1, 4 & 5) are direct manifestations of Bruner's interests in problems of education, and a fourth (no. 3) is closely allied. While not claiming that this is the main reason for the selection, it is proper for us to note the fact. The five areas were: One concerned with the "Sequences of a Curriculum," a second with "The Apparatus of Teaching," a third with "The Motivation of Learning," a fourth with "The Role of Intuition in Learning and Thinking," and a fifth with "Cognitive Processes in Learning." Bruner was a member of the fifth group, the one most related to his previous competence.

At the end of the conference it was necessary to arrive at a summarizing and concluding formulation of the accomplishments of the entire group. This fell to Jerome Bruner and resulted in his book *The Process of Education* (1960), which is generally considered a highly important and creative synthesis of many significant points of view.

> It fell to the Chairman, then, to prepare a Chairman's report—perforce a selective account of what in his view were the major themes, the principal conjectures, and the most striking tentative conclusions reached. In a proper sense it is the Chairman who is principally responsible for the pages that follow, however much he made every effort to reflect the thought of his colleagues... The final draft was greatly sided by the comments of participants—though again it was not undertaken in the spirit of trying to find a consensus. Rather, the pages that follow constitute my conception of the "sense of the meeting" and inevitably will reflect the biases and predilections I bring to the task (1960, p. xiii).

This book was, to my thinking, an achievement of creative synthesis, of putting together a lot of ideas in terms of a certain conceptualization of the learning process. And this conceptualization bears the clear stamp of the previous research into problems of thinking that led Bruner into the area of education.

Since that time much of his research interests have been centered around questions of intellectual development and methods of teaching. Such work may deal with a postulated pattern of "technological advances" in thinking of a child, or with the significance of representation in mathematical instruction.

What can we say now about Jerome Bruner as a creative thinker? Creative products we can easily see. These range from systematic investigation of an important problem, such as concept attainment, to the collection of "Essays for the Left Hand," *On Knowing* (1962), which represent the more speculative, less rigorous thinking about the problems of knowledge, creativity and education. But does this fit our definition? I think so.

While it is obvious that we don't have the ideal sort of generation of novel belief systems which violate previous ones, I think we have here, as with McClelland for one, the pursuit of one basic question, and its implications, to the point where it begins to take on paradigmatic aspects, although it is not a restructuring of the entire field. The question of how people build their concepts of the world is essentially the question Rokeach is asking in a different way; and in a sense it is more basic. Rokeach is dealing with that set of concepts known as beliefs, and then mainly with beliefs as they reveal basic character structures and the implications of these structures. Bruner is asking a

question about all cognition, and it is broader than a concern with the character structure, one area of its implications. In this sense it is paradigmatic, even though it does not build into a systematized concept of human nature.

We also have another creative aspect. In making the leap from the concept attainment of human beings, to the intellectual development of human beings, viewed in terms of concept attainment, Bruner has moved a major sub-paradigm. And this sub-paradigm has, besides its theoretical significance, also a considerable social significance, and is expressive of a real social interest.

In much the same manner as McClelland, Bruner, starting with a dissatisfaction, a sense of a problem, moved from one aspect of a larger problem to another, from one sense of gap to the next, from preoccupation to preoccupation. And he, too, without any necessary conscious realization, was filling out many of the implications of a paradigmatic question. Reaching a certain stage of completion, having pretty much worked out a major sub-paradigm, he was able to leap to another. And again, like McClelland, this new stage is important not only theoretically but socially, and may also be traced to certain character traits and early influences. Just as the work on inducing achievement motivation is a radical step in that it attempts to produce the phenomena that McClelland is theorizing about, so, too, is Bruner engaged in creative "change-research;" not only theoretical investigation, but actually work in curriculum reform. There is a double play here of theoretical research and social activity that involves much creative innovation in theory and method. I don't think that we are deforming our definition by including the work of Jerome Bruner in our conception of creative processes. As a child Bruner dreamt that he had to communicate everything that was known to people who knew nothing of what had come before. Whatever else this may mean, I think we might see in it a foreshadowing of his present deep involvement with the process of educating children.

Chapter VIII: B. F. Skinner: The Science of Human Behavior

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Any catalogue of the most creative and important psychologists alive would have to include B. F. Skinner in a prominent position. Not only is he the leading representative of one of the major forces in psychological theory, but his creative accomplishments are such that they are recognized even by those whose positions are totally opposed to his. Although working within a pre-existing framework, Skinner has changed the nature of this very framework in very significant ways. Pavlov was the ancestor, and Watson the father of Skinnerian Behaviorism, but in the final analysis, the system as it stands is his. Professor of Psychology at Harvard University, Skinner has promulgated his position through five books, ranging from methodological description to Utopian speculation (his novel, *Walden Two* (1948) is the only fiction written, to my knowledge, by a prominent contemporary psychologist), and numerous articles. He has also made significant methodological innovations. Many psychologists may not like his work, but they ignore it at their peril. More than any of the other subjects, except perhaps Maslow, Skinner is a theorist about whom one cannot be neutral.

The interview is, unfortunately, subject to some limitations. First, a heavy schedule limited the available time to one hour, recorded October 15th, 1963. Skinner has published an autobiographical [*sic*], "Case History in Scientific Method" (in Skinner, 1959), and, therefore, did not deal at all with sections III, IV & V of the outline, feeling that the paper covered them. As it happens, it only covers some of the headings. The case-study that follows will be both limited in scope and detail, and will of necessity rely for large sections wholly on published information.

Early conditioning

"My father was a lawyer, but actually did not go to college, he went directly to law school from high school. My mother did not have a college education. They were, however, both reasonably interested in intellectual matters; there was music in the home, and I think it was a pretty good background. I went to the only college I ever considered, which happened to be recommended by a friend of my father's."

"It was a small town. I graduated in a class of only 12 members. I know most of the people in the town, one way or another. Actually it was a dying kind of community, which is now practically dead. There was an early Anglo-Saxon, I suppose, population in the town, which was, by the way, Susquehanna, Pennsylvania. There was a large importation of Irish and Italian railroad workers, who settled there and became the important people in the town. I was not strictly from the Protestant, Anglo-Saxon background, but was identified with it throughout my childhood."

"I came under the influence of a very important person, a Miss Graves, a teacher to whom I am going to dedicate a book I am writing now, *The Technology of Teaching*. Her father was the local atheist, a stone-cutter who tried to keep people from celebrating New Year's Eve, 1900, because he argued that this was only the beginning of the last year of the 19th Century, the 20th Century wouldn't start for a year. He was a Darwinian and a botanist. Miss Graves once showed me a letter he had received from the Prince of Monaco offering to exchange pressed flowers."

"She taught me Sunday School in a Presbyterian Church for many years. There was a group of boys, we started together and kept together; we went through pretty much all of the Old Testament under her guidance. She was liberal, and I suppose, partly because of that I quickly lost my religion and have no interest in religion at all."

"I did feel a little apart from others. I discovered this slowly. I always supposed that everyone in the community would be as ambitious as I, and it was a great shock to me when other members of my peer-group simply did not go to college and went to work in the local railroad shops. I didn't discover any individuality, any difference from these people till I was hit over the head with it, actually."

"I didn't feel persecuted. There was some feeling in the town, for some strange reason, on the part of the Irish, against me and my family. My father defended an Italian for murdering an Irishman and he got him off. The Irish never forgave him and the Italians never got over loving him for this. I grew up with a warm feeling for Italians, which I still have, and somewhat doubtful kind of race prejudice with respect to the Irish. This is ridiculous, but that is the source of it."

"I went on to this college, Hamilton College, which was at the low point in its career, I think. I took a miscellany of courses, under the recommendation of friends and so on. There wasn't a bit of career counseling at the time. I had a lot of English, a lot of French,

I took French theatre, modern French literature, Anglo-Saxon, Chaucer, Shakespeare, Restoration Drama, Romantic poets, 19th Century novels, I had Greek and Roman art, I had Political Science, I had Botany, Zoology, cat Anatomy, Embryology, lots of required courses in Public Speaking, required courses in English composition, two years of Greek, two years of Spanish. The damndest collection imaginable. It would look like the devil on a program today. But in some curious way I have made professional use of every scrap of that, somehow or other. It is amazing to think of it; and I now recommend to people in a liberal arts program, 'For god's sake, don't specialize! If there is anything you feel like taking, for any reason whatsoever, it will come in handy.' "

"I didn't have any outstanding teachers in college, I guess, except a Biology teacher, who, apart from the courses he was teaching, told me about Pavlov and Loeb."

"I wanted to be a writer. When I was a senior in college, I got a letter from Robert Frost, whom I had met the preceding summer and to whom I had sent some short stories. And he sent a very laudatory letter, with glamorous phrases like, 'You're worth twice anyone else I seen [*sic*] in prose this year,' and so on. This set me back two years, because it confirmed my resolution to be a writer. And I tried and failed miserably; finally discovering, and I am proud of my honesty in this, that I had nothing to say, and there was no point in knowing how to say it well. And I turned to psychology as the only science in which I though I would be suited, equipped for. Mainly because it did deal with the same things that literature did. I wasn't shifting my field, I was just shifting my techniques. Although I became very sour on literature, and went through a phase of being very contemptuous of the whole enterprise."

"I had had no psychology as an undergraduate at all. It was recommended to me to go to Harvard by the president of Hamilton College, when I asked about the study of psychology, when I visited the college a year or so after graduating. He reached into a drawer, and took out a musty old mimeographed sheet, which told him that Columbia and Harvard were the outstanding centers for psychology. I suppose this must have been prepared while William James was still alive. In any case, I came to Harvard, didn't find at all what I expected, because I had read Pavlov and Watson and there was nothing at all of that kind going on at Harvard. From here on, I have described my work in 'A case history in scientific method.' "

The operant personality

"I am aware that I am highly motivated. I work well, I don't believe I work to dominate anybody. I don't get involved with controversies, to prove someone is wrong. The best way, I find, is to say nothing, and somebody else will prove he is wrong for you, if he is wrong. I have a certain amount of crusader's zeal, I think, that comes out in *Walden Two*; I am a do-gooder, I have to improve mankind; I have messianic feelings; I have a

sense of destiny. I don't enjoy the iconoclastic sides of my work, although that has been relevant every once in a while."

"I was an older child, I had a younger brother, he died when I was 17. We were competitive, there was sibling rivalry, I undoubtedly have something of that in me. I was not competitive in college, I didn't give a damn about honors."

"I've never been under any publication pressure, I've never felt that I had to publish in order to get on in the world. I have never given a damn about politics, in the department or anywhere else. I don't care about honors, I've had my share of them, medals, membership in learned societies, national academy; I've had them, and they're all ashes in my mouth after I get them. I am pleased a bit at the time, but not very much. I don't allow my name to appear for the presidency of the APA, which is an honor, and I'd like to have it, but I don't have the time, or interest, really. I am not in a race with anybody, so far as I regard all of this."

"I am certainly independent, no doubt about this. A friend of mine said I was the most inner directed person he knew, and I dare say that's right. I am anxious not to be influenced by the opinions of my contemporaries, I don't think much of them, and I prefer to settle for my own standards. I have very rigorous standards of intellectual honesty and integrity in my work, and those are imposed by me in a very independent way, I think. I don't think there is any rivalry, or attempt to dominate. If independence means having your own way in that sense, then I am not. But I am very much self-determined. Of course, I would qualify that to mean I was determined by my early environment very heavily."

"I don't know what self actualization means, pardon me Professor Maslow. I like to be creative, at times I have painted, sculpted, I play the piano, recently I picked up an electric organ, and I also own a clavichord, I play them a bit. I like security, and have carefully arranged my life so that I feel secure, and don't find myself lying awake at night, or bickering with my colleagues, and so on. I think I am warmly affectionate, particularly to people I love. I express myself very easily to my two daughters. I think they would say I am a very warm kind of parent. I feel very close to them, I have been a successful father, although I haven't done half of the things I knew I should do. I have tried to apply my own thinking to my role as a father. For example, I found out recently that I was annoying my daughter in my letters to her, by praising her a bit too much. So I made a specific resolution. For a while my letters will contain no word of commendation. If this was bothering her, I'll just stop it. If this means I am not really being myself to my daughter, well, all right, I say the hell with that. If I find that I am bothering someone in a given way, I change. It's important to me not to bother them."

"What are my peak experiences? Well, I assume you rule out orgasms and things like that, and great relief from anxieties and so on. I don't know that I've had any, I've always been bothered by the fact that the things that I have done, which I now feel were

valuable, I didn't realize at the time were valuable. It would take a long time to realize that I had discovered something, for example. There is no moment in history when you suddenly realize that you have done it. With one possible exception, I think. When I first worked out the lever-box system, I was then very much under Pavlov's influence. But I had something different, and didn't realize at the time. But I was reinforcing a rat for pressing a lever to get food, and watching the rate change as the rat ingested the food. And one day I disconnected the food dispenser and recorded an extinction curve; it had cycles, and it was very smooth. Then I do remember this feeling, that this is terribly important, and I was very careful how I crossed the street for two or three days, until I had gotten that written up in some kind of permanent form. With that exception, I don't think I've ever felt anything I was doing at that moment was really very great."

"My life goals are certainly fulfilled. I still have a lot of work to do, but if I were to die tomorrow, I would feel that I had lived, and very well. I have got work planned for the next five to ten years, and I am trying to keep the decks clear so that I can devote myself fully to it. It will be important to me in rounding out what seems to me to be a reasonable pattern of one's intellectual life. I don't have day-dreams that don't get fulfilled, that I know of. I don't think, actually that I could make three wishes."

"I became convinced, largely I think because of Bertrand Russell's interest in a behavioristic epistemology that behaviorism and positivism were the way out, and I have continued to develop that. Curiously, I think if I could have specified, if I could have seen in 1928, where I am now, it would have been precisely what I wanted to do, at that time. I have been very lucky in being able to follow up and develop along lines that I wanted to follow, I have never shifted my course at any point. Now this may be rigidity, but on the other hand I think it has been determined by success. I have done what I hoped to do, and feel perfectly happy about the current situation."

"I didn't learn much from other people. I have been a very close friend of Fred Keller, professor of Psychology at Columbia, since graduate school days. We have influenced each other considerably. He was die-hard, stubborn behaviorist at the time that I needed to have someone to stand up for that, and he was very important in my development, I am sure. I worked with Crozier, in general physiology, rather than with the psychologists at Harvard, and I learned a great deal about methods from him."

"I have never collaborated with anybody in any important way. I have published a few papers with students, but it has never been an extensive collaboration. I don't know which books have influenced me particularly, or what peers. At Minnesota, I found no one who particularly bolstered my activities or interests there, certainly no one when I was at Indiana briefly as chairman, and I think no one here."

"I have lived relatively independent of the intellectual environment in which I have been, I would say. I hoe my own row of beans, and am satisfied with doing that, and am not in any hurry to move on. I have never had any doubt at all of the general correctness

of the point of view I have taken, or of the value of what I have done. I have been able to survive long periods of neglect on the part of my colleagues without too much trouble. Now it is the opposite, I suffer from too little neglect. I am trying to generate some more so that I will have time to do the things I really want to do."

"I have noted somewhere that practically all of my non-experimental papers have been prepared for colloquia, conferences, etc. Evidently I need some kind of external spur to get me going. Most of the non-experimental papers in *Cumulative Record* (1959) were done for special occasions. I have, however, planned and carried through on books without any pressure of that sort. It took me, off and on, 20 years to write *Verbal Behavior* (1957). I wrote three other books during that period, I kept at it and finally got it the way I wanted it. I am now working on a book on the technology of teaching, which will be my swan song in that field. I've been at it pretty intensively for 3 or 4 years now. I'd hoped to finish it in one, I still have one to go. I am then planning a book on the design of cultures."

"My students have always been very helpful. Two or three times I've had seminars which really developed new ideas, went along very effectively. Sometimes it doesn't work that way. My big course, for which I wrote *Science and Human Behavior*, has always been a good testing ground."

"My thinking is a much less structured activity than the hypothetical-deductive design type of thing. My methods were not designed in advance, I don't believe in experimental design à la R. A. Fisher. The modern structure of the analysis of operant behavior has developed piecemeal, nothing was seen in advance. There was no hypothesis testing."

"I don't pay too much attention to the feedback, it doesn't matter much to me, and I don't think I change my views or plans in light of that feedback at all. Further work grows out of the past, and I think of trying to be as honest as possible in avoiding ways of smudging over inadequacies and so on."

"I think in general my writing shows deep organization. I organize a manuscript through a very elaborate decimal system, which I wish I could have in the final form; but publishers hate decimals in front of paragraphs, it scare off readers, I guess. But all of my books have been carefully designed, organized in that way. I write with elaborate outlines in book form, card indices, and then when I am writing a couple of paragraphs, I write on a large sheet, 22x34, and I can see the whole set of paragraphs, or even the whole chapter in outline form on that sheet. I work in the Baconian fashion, I am assembling ideas, integrating them, putting them together till they flow. I will often write a chapter fifteen times before it says what I really want it to say. Actually it is a process of discovering what you have to say, and is very different from thinking you know in advance and then writing it."

"The only exception to that rule is the writing of my novel, *Walden Two*, which is the closest thing to automatic writing I've ever done. I wrote the book often with great emo-

tional involvement, almost in a frenzy sometimes. That book is undoubtedly a catharsis, a clarification of two sides of my personality, in which Frazier emerges victorious. I became a Frazierian after writing the book."

"I always avoid labelling if possible. I am always suspicious if I continue to have to use one label too long. It does distort, it keeps you from seeing what you're talking about. I have made up a few words in my time, such as operant behavior, but only when absolutely necessary. I don't like to invent words, some people seem to love it, but I don't. But sometimes a point is reached where you must do something about it. For example, the name of the schedules which we have analyzed, these had to be invented, there was nothing to describe them. But, in general, I am very suspicious of formulations which I use too long, I think they restrict your thinking. I don't label if I can help it."

A case-history in operant behavior

A large part of Skinner's paper, "A case-history in scientific method" (1959, pp. 76–100) deals with the development of his behaviorist belief system from the time he first accepted this as the "true" way till the point at which he published *The Behavior of Organisms* (1938), his first important work. This is, in fact, a report of the processes that resulted in some of his most creative innovations, conceptual and methodological. I will not give the whole report here, but will rather select what I think are the essential points for our concern in the same way that I have done in the other studies. All quotes in this discussion will be from the paper, to which the reader is referred for the complete exposition.

We have already seen that before coming to Harvard, Skinner had read Loeb and Pavlov, and had been further influenced by reading Russell's discussion of the epistemology of Watson's behaviorism. This led him to Watson and to behaviorism. "Many years later when I told Lord Russell that his articles were responsible for my interest in behavior, he could only exclaim, 'Good heavens! I had always supposed that these articles had demolished behaviorism!' But at any rate he had taken Watson seriously, and so did I."

We also know that he worked at Harvard under Crozier in physiology. "It had been said of Loeb, and might have been said of Crozier, that he 'resented the nervous system.' Whether this was true or not, the fact was that both these men talked about animal behavior without mentioning the nervous system and with surprising success. So far as I was concerned, they cancelled out the physiological theorizing of Pavlov and Sherrington and thus clarified what remained of the work of these men as the beginnings of an independent science of behavior. My doctoral thesis was in part an operational analysis of Sherrington's synapse, in which behavioral laws were substituted for supposed states of the nervous system. . . So far as I can see, I began simply by looking for lawful pro-

cesses in the behavior of the intact organism. Pavlov had shown the way; but I could not then, as I cannot now, move from salivary reflexes to the important business of the organism in everyday life. Sherrington and Magnus had found order in surgical segments of the organism. Could not something of the same sort be found, to use Loeb's term, in the organism as a whole? I had the clue from Pavlov; control your conditions and you will see order."

The first experiment he tried had to do with the behavior of a rat emerging into a new environment. "The major result of this experiment was that some of my rats had babies. I began to watch young rats. I saw them right themselves and crawl about very much like the decerebrate or thalamic cats and rabbits of Magnus. So I set about studying the postural reflexes of young rats. Here was a first principle not formally recognized by scientific methodologists: When you run into something interesting, drop everything else and study it. I tore up (the experiment) and started over."

With the young rats Skinner eventually became interested in recording quantitatively various movements. Then this became the primary interest and he returned to adult rats. Then this became the primary interest and he returned to adult rats. He began developing instruments for measuring and recording their movements. "Now for a second unformalized principle of scientific practice: Some ways of doing research are easier than others. I got tired of carrying the rat back to the other end of the runway." He now developed a continuous runway along which the rat moved, and with which his movements could be measured. He noticed that the rat would delay at one point on the runway. "When I timed these delays with a stop watch, however, and plotted them, they seemed to show orderly changes. This was, of course, the kind of thing I was looking for." In other words, a lawful behavior process. "I forgot all about the movements of the substratum and began to run rats for the sake of the delay measurements alone. But there was now no reason why the runway had to be eight feet long, and as the second principle came into play again, I saw no reason why the rat could not deliver its own reinforcement." Here we have what will be a major methodological innovation. He built a new apparatus, in which the rat, by moving along the runway, caused a food-pellet to fall into a cup. Each tilt of the runway was recorded on a moving kymograph.

"A third unformalized principle of scientific practice: Some people are lucky." The food magazine he had used was an old piece of something else, a central spindle. "One day it occurred to me that if I wound a string around the spindle and allowed it to unwind as the magazine was emptied I would get a different kind of record. Instead of a mere report of the up-and-down movement of the runway, as a series of pipe in a polygraph, I would get a curve. And I knew that science made great use of curves, although, so far as I could discover, very little of pips on a polygraph. The difference between the old type of record and the new way may not seem great, but as it turned out the curve revealed things in the rate of responding, and in changes in that rate, which

would otherwise have been missed. By allowing that string to unwind rather than to wind, I had got my curve in an awkward Cartesian quadrant, but that was easily remedied. Psychologists have adopted cumulative curves only very slowly, but I think it is fair to say that they have become an indispensable tool for certain purposes of analysis." From this point Skinner abandoned the runway, thus making a complete break with the problem that he had been dealing with at first, or rather, secondly. The methodological innovation of the cumulative record led to the next important instrumental invention, and together these culminated in the first important theoretical innovation.

He now has the rat reaching for food, and in doing so causing a pan to record one step in a cumulative record. "The first major change in rate observed in this way was due to ingestion. Curves showing how the rate of eating declined with the eating time comprised the other part of my thesis. But a refinement was needed. The behavior of the rat in pushing open the door was not a normal part of the ingestive behavior of *Rattus rattus*. The act was obviously learned, but its status as part of the final performance was not clear. It seemed wise to add an additional conditional response connected with ingestion in quite an arbitrary way. I chose the first device which came to mind—a horizontal bar or lever placed where it could be conveniently depressed by the rat to close a switch which operated a magnetic magazines... Now, as soon as you begin to complicate an apparatus, you necessarily invoke a fourth principle of scientific practice: Apparatuses sometimes break down. I had only to wait for the food magazine to jam to get an extinction curve. At first I treated this as a defect and hastened to remedy the difficulty. But eventually, of course, I deliberately disconnected the magazine. I can easily recall the excitement of the first complete extinction curve. I had made contact with Pavlov at last: It was an orderly change due to nothing more than a special contingency of reinforcement. It was pure behavior!" It is this we have seen above as his best recollection of a peak experience. "I am not saying that I would not have gotten around to extinction curves without a breakdown in the apparatus; Pavlov had given too strong a lead in that direction. But it is still no exaggeration to say that some of the most interesting and surprising results have turned up first because of similar accidents." At this point he began to study the conditioning and reinforcement curves in great detail and with many rats.

"At this point I made my first use of the deductive method." He was running tests with eight rats, each consuming about 100 pellets a day, and it was very difficult to keep up the supply. It was this purely external problem that led to the next major leap.

"Since I do not wish to deprecate the hypothetic-deductive method, I am glad to testify here to its usefulness. It led me to apply our second principle of unformalized scientific practice and to ask myself why every press of the lever had to be reinforced... I decided to reinforce only once every minute and to allow all other responses to go unreinforced. There were two results: (a) my supply of pellets lasted almost indefinitely, and (b) each rat stabilized at a fairly constant rate of responding."

"Now, a steady state is something I was familiar with from physical chemistry, and I therefore embarked on a study of periodic reinforcement." It was while doing this that Skinner decided to try reinforcing, not according to time intervals, but number of responses. This was originally meant to produce varying states of deprivation, but it turned out that the rat adapted to this also. "This is 'fixed-ration' rather than 'fixed-interval' reinforcement and, as I soon found out, it produces a very different type of performance. This is an example of a fifth unformalized principle of scientific practice, but one which has been named. Walter Cannon described it with a word invented by Horace Walpole: Serendipity—the art of finding one thing while looking for something else."

"This account of my scientific behavior up to the point at which I published my results in a book called *The Behavior of Organisms* is as exact in letter and spirit as I can make it. The notes, data, and publications which I have examined do not show that I ever behaved in the manner of Men Thinking as described by John Stuart Mill or John Dewey in reconstructions of scientific behavior by other philosophers of science. I never faced a problem that was more than the eternal problem of finding order. I never attacked a problem by formulating a Hypothesis. I never deduced Theories or submitted them to Experimental Check. So far as I can see, I had no preconceived Model of behavior—certainly not a physiological one or a mentalistic one... Of course, I was working on a basic assumption that there was an order in behavior if only I could discover it—but such an assumption is not to be confused with the hypotheses of deductive theory. It is also true that I exercised a certain Selection of Facts but not because of relevance to theory but because one fact was more orderly than another. If I engaged in Experimental Design at all, it was simply to complete or extend some evidence of order already observed."

We have here the most complete disavowal of the hypothetical deductive system as a mode of research that I can find in any of the subjects, though they have each made similar statements.

But this does not show that Skinner did not proceed in a manner consonant with our conceptualization. His research was guided by a specific, paradigmatic question: What are the objective laws of human, or animal, behavior? This question was posed as a clear renunciation, although not original to Skinner, of the theories that postulated an important role for the nervous system in determining behavior. Skinner went farther than ever before in finding methods to demonstrate the existence of, and formulating the nature of "laws of behavior."

Skinner's answers to the question eventually, if not during the solution process, took the form of a theory which purports to be applicable to all animal behavior. The basic concept here is the operant, the unit of behavior that becomes a discrete, known performance activity as a result of correct reinforcement. Closely connected is the possibility of extinguishing behavior, reversing operants. And the major methodological techniques

developed were, on the experimental level, the cumulative record and the lever box—for training and observing operant behavior; on a more general level, the reinforcement schedules—for developing various operants. These are significant answers to a basic question. And they are so conceived as to imply a theory of human nature. Further implications of the concept would possibly be, as in other concepts above, the explanation of educational and cultural processes in these terms, and the use of these techniques to influence the processes.

In the field of education Skinner applied his paradigm theoretically and developed learning theories. These theories implied the value of utilizing the Skinnerian techniques in education. And here we have one of Skinner's socially creative products, the teaching machine. He is dealing here with change-research, as were McClelland and Bruner.

On the more basic level of human nature in a social context, Skinner has restricted himself to the speculative. His next planned book will attempt to be more systematic in dealing with the design of cultures. One of the things that follows from the basic paradigm, is that you can, with these techniques, change society, mold it. And Skinner's system is so complete that it even takes in a set of derivative soecial values. And the result is *Walden Two*, a fictional utopia in which people are trained to be happy, conditioned by tried and true Skinnerian reinforcement techniques, to fit the concept of the ideal man that is held by Frazier, the leader of his people who represents Skinner's social interest. *Walden Two* is the perfect society of a system whose values and basic belief derive from the Skinnerian paradigm. This, too, however hard to swallow for people outside the paradigm, is a creative extension of the implications of the system. I would like to end what is, I hope, a clear exposition of the creative nature of Skinner's research with a quotation from *Walden Two*, spoken by Frazier. In this passage we see something of the character of Skinner's view of research, and we get an interesting insight into the nature of his ideal society and its ruler that reveals both the authoritarian and the benevolent social interest.

> I have only one important characteristic, Burris; I'm stubborn. I've had only idea in my life—the true idée fixe... [T]o put it as bluntly as possible, the idea of having my own way. "Control" expresses it, I think. The control of human behavior, Burris. In my experimental days it was a frenzied, selfish desire to dominate. I remember the rage I used to feel when a prediction went awry. I could have shouted at the subjects of my experiments, "Behave, damn you, as you ought!" Eventually I realized that the subjects were always right. They always behaved as they ought. It was I who was wrong. I had made a bad prediction. And what a strange discovery for a would-be tyrant, that the only effective technique of control is unselfish (1948, p. 271).

Chapter IX: Conclusion: A Pluralistic View

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> No more than we can describe the ideal wife can we describe the ideal science or scientist, or method or question or activity or research. Just as we approve of marriage in general and still leave individual choices to individual tastes, so also can we be pluralistic in science (Maslow, 1954, p. 4).

We have examined a fair amount of autobiographical recollections of their lives and work as reported by six psychologists whom we have reason to consider creative. What, then, is to be concluded from these about the nature of the creative personality and the creative process?

The most striking impression that the case-studies present to me as a whole is of the variety, the pluralism of backgrounds, development, personality and research interests and activities. But, along with this, and equally important, I feel that there is a possibility for finding some common characteristics, structural if not contentual [*sic*], which might be relevant to the creative personality and process.

What we have here is not a large scale and quantitative study, and we cannot easily tabulate the similarities and differences of our subjects, nor relate this study with ease to any other study in the same field. But what we do have, and I feel it is at least equally valid, is a body of material with greater depth than most studies, in that the criteria for most of the information is its relevance for the subject; and, above all material which imparts, I hope, an impression of personality and interests that is able to survive the imposition of external structuring and presentation. In this aspect these studies offer us something usually only available in the autobiographical reflections that are, unfortunately, all too rare. But they also have a certain advantage in that the very structure, however minimal, imposed by the investigator upon the subject, with its adverse effects on the subject's personal criteria gives the studies a certain, limited degree of comparability. In other words, what is attempted here is a study of the creative personality and process that achieves what McClelland termed a middle level of generality, neither too

global nor picayune and trivial.

The child as father of the man

For obvious reasons our studies do not offer the sort of material necessary for a psychoanalytic or epigenetic discussion of the childhood experiences of the subjects. What can one say about the similarities and differences, on various levels, in the family backgrounds and early development of our creative psychologists? Here, as in the further areas of discussion, it will be necessary to keep one thing in mind. While I think we might isolate certain relevant, even important, common structural qualities, so to speak, the similar or dissimilar aspects of individual life-content cannot be claimed to have any general implications because we are dealing with a very small and non-random sample. None of these conclusions are put forth as revealing laws or even principles of human nature, creative or otherwise.

Religion is a factor of varying importance. So, too, is geographic origin. We have in the sample two subjects with orthodox, semi-ghetto Jewish backgrounds; two with liberal, semi-assimilated Jewish backgrounds; one Methodist minister's son; and one Presbyterian. I might venture to say, somewhat facetiously, that this is a representative sample of contemporary psychologists.

Can we draw any conclusions as to the role of the religious factor? Of all of the subjects, only one reported any religious interests past childhood. But even here, in the case of David McClelland, there is a movement, via conversion, to a less theistic form of religion, to Quakerism. As he put it, "I didn't give (religion) up wholly, as did most of my generation, but converted to a more radical form." In effect, he chose a form of religion more noted for social than theistic concern.

Skinner lost his religious beliefs and interests at an early age. None of the others report ever having any real belief in religion. In our four Jews, we have an interesting spectrum. The two, Simon and Bruner, who grew up in non-religious Jewish families, see this factor in a neutral or even positive light. Simon felt here an element of apartness, but also an "unwillingness to reject the identification." Bruner considers a stressing of intellectual curiosity "one of the benefits of being a Jew, among many." For the two, Maslow and Rokeach, whose families and backgrounds were religious and orthodox, to lesser or greater extents, this was more important, and in a reverse way. For Maslow this was one more way in which he felt divorced from and opposed to his family and his mother in particular. From her he learned to despise superstition and the empty hypocrisy of much religion. Rokeach, forced to go to the yeshivah by a very orthodox family, rebelled so strongly that this very rebellion became one of the most important elements in the militant independence that shaped his professional training and research. Coming from probably the most religious family, Rokeach is easily the most irreligious,

even anti-religious (in any common sense of the term) of the subjects; yet, we have seen, the most influenced by religion—in a negative way. For three of our subjects, being Jewish contributed to a feeling of apartness. Maslow, in particular, emphasizes this, "It definitely meant exile from the society." He is also the only one to report any clear example of religious persecution after childhood.

In general, I think we can say that it is typical of all of the subjects to give up religious belief at an early age, and I think that this is indicative of the intellectual independence that is one of their most striking common characteristics.

All six subjects had siblings, and in each case there is some evidence of sibling rivalry. Two things struck me in this regard. The first is that, to my knowledge, in each case only the subject, of all his siblings, went into an academic profession and achieved prominence as an intellectual. The second fact is that only two of the subjects were eldest sibs, and it is precisely these two, Maslow and Skinner, who are today in the position of being considered leading representatives of distinct points of view. We might talk of Maslovian or Skinnerian psychology, however these differ, in a sense that we would not talk of any of the others. Well, so much for family constellations.

The next area where I think there are interesting comparisons is that of interest development. Simon decided at an early age to be a social scientist, and his training covered a broad spectrum of the social and political sciences, excluding psychology. He ended up in psychology as a result of following the question he was obsessed with to its more elemental aspects. McClelland and Skinner went to college planning on pursuing literary, or linguistic studies in the "humanities." Only later did they decide to study psychology. Maslow and Rokeach chose psychology early and this choice determined the nature of their entire course of study from that point. Bruner happened almost accidentally on psychology as a field.

To look at it another way, Simon and Skinner chose psychology at a later stage because it asked and answered questions in a way they liked; Rokeach and Maslow had chosen it early for that reason. Bruner and McClelland chose it almost accidentally without the same degree of deliberateness.

Of the six, McClelland and Skinner have the widest background in the humanities. And they each consider this valuable and important. Skinner proudly points to a wide conglomeration of college courses, claiming that he has been able to use "every scrap of that" in his professional life. McClelland thinks he had broadened his interests, mainly by studying many languages and their literatures, to such an extent that he was able in college to narrow his interests and undergo specialization rather than expanding of interests. He, too, sees the availability of general knowledge as essential, "you have to cast a wide net." Maslow, who had been a voracious reader as a child and "lived in the library" went about becoming a psychologist by studying anything and everything he thought might be necessary to "make me a better psychologist."

I think that one of the things we can say generally about all of the subjects is that, in whatever individual fashion, they are aware of the need for broad and varied knowledge and interest. And, perhaps more importantly, this interest is clearly related to their primary intellectual concerns in psychology. Whether the broadening came before or after they committed themselves to problems of an essentially psychological nature, they see their general knowledge as an important aspect of their work as psychologists. Part of this feeling is nicely stated in something Simon said: "One rule of the game for me is, if there is something that is intellectually important in the culture, then you have to learn what you have to learn in order to read it, and understand it." "Did you do things you really didn't like doing?" (LPG) "Oh, sure. Well, didn't like is a hard term. There is just a lot of drudgery and boredom in learning hard things isn't there, along with the fun. But it's a form of vanity, I guess. I don't like to admit anything is intellectually impossible for me."

Portrait of the thinker

All of our subjects report that they are highly motivated by the need to achieve. Indeed, they have all achieved much, certainly they are all very productive. Their productivity has been, I think it is fair to say, internally rather than externally motivated. Every one of them denied ever feeling a necessity to publish to avoid perishing in the usual sense of the phrase. They published out of an inner desire to communicate, and this desire stems, I think, more from a social interest of the sort Adler meant than from a desire for feedback. Often, as with Skinner, they report little or no concern for the opinions of their contemporaries; it is not for them that they publish, in the last analysis, but for themselves and for "society."

This is connected with a sense of destiny, a need to feel that what you are doing matters, that it makes a difference. Such a sense arises both from the inner implications of a paradigmatic question, as Rokeach points out (cf. Chapter I), and out of their achievement made. Simon feels that his work, say the use of computer simulation, is the dawn of a new era. Skinner sees his theories as making possible the control of human behavior for the "production" of happier and healthier human beings. Maslow sees a new psychology coming over the horizon, and his work is a trumpet heralding the new era. McClelland is going out, as Alexander, to change history. Bruner is engaged in reforming the practice of education. All feel a certain sense of the prophetic, if not the messianic.

In this relation I think it is interesting to note the extent and nature of their actual social endeavors. Of all the subjects only three are actually engaged in applying their theories to the processes of social change (although Simon is also, to a limited extent, in industrial consultation, but "deep down inside I don't care if General Motors makes a

buck next year.") McClelland is engaged on the most ambitious application of his theory to actual social processes. He is attempting, in his words, to use his general speculations as a physicist, to be an engineer now and build particular bridges at particular places at particular moments. Also, his efforts are the most expressive of the total nature of the basic question he has asked. He is, too, the Quaker, who feels not only that he wants to improve the world, as the others do, but feels the need to go out and try.

Bruner and Skinner are both, in different ways, applying their theoretical thinking to attempt to improve the methods and nature of education in our society. For Skinner the development of the teaching machines is an aspect, and a possible demonstration of a general theory of human behavior. For both there is a genuine social interest and a natural outgrowth of a line of inquiry.

But perhaps the most important point to be made is that none of our subjects are engaging in social change-research of the most radical sort. McClelland might be changing history, but he is doing so within accepted conceptual and instrumental frameworks, however radical the methods. However, to choose the extreme examples, Maslow is not going into the world and teaching children to self-actualize, at most he is working (and this is very important certainly) with management training and other such re-education efforts; Skinner has not gone out and set up an operating operant community; his Walden Two remains fictional speculation; the part he is implementing is more limited.

I think there are two related conclusions to be drawn here. When someone develops a theory of human nature as radical and original as Skinner's or Maslow's, they have abandoned the accepted conceptual and instrumental framework of their society and their profession. This is actually one of the hallmarks of their creative achievement. But, in this they have also made it impossible to indulge in extensive change-research to implement their theories. Their ideas are too radical and too controversial for this. We can easily make the point by imagining what would happen if both Skinner and Maslow, to name but two, were to attempt to apply their theories and change society in the light of them. When somebody generates so general a theory of human nature, he also makes it impossible, pragmatically, to implement it in any drastic sense. And here we have the second point. The limited applications that are possible, let alone the drastic ones, will of necessity involve compromises with the accepted paradigms. The thinkers who arrive at novel and radical visions of man and society will characteristically be unwilling to submit to half-way transformations and will prefer to keep their most drastic theories in the speculative realm. The implementation of radical change needs to be effected by a different sort. He who hoes his own row of beans and is content will not change society. This is done by the disciples, the apostles, who are both able to compromise and who are not as emotionally involved with the basic nature of the new paradigm as the creator will be of necessity. Moses might give his people the law and bring them to the

Promised Land, but once there he must stop and allow the administrator, Joshua, to lead them in. More dramatically, Jesus must be crucified for his disciples to bring about the establishment of the Church Militant. The priests must take over from the prophet. And, in another sense, society may listen to the gadfly, but they are more likely to give him hemlock than to admit his influence. In our sample, it is the one who believes in science as the accumulation of knowledge, not theory, who is going out to change history.

All of the subjects clearly consider themselves to be independent in their thinking, and I think that these judgments are confirmed, if only subjectively, in their reports. I think we can also confirm such subjective evaluations by examining their professional work, which displays the independence of thought, revealed through formulation [*sic*] novel belief systems and developing novel heuristics and methods, that we postulated as aspects of the creative process.

In all cases we can, to some extent, relate the growth of intellectual independence to feelings of apartness and to elements in the environment and childhood of the subject. Rokeach's case is the most extreme, and, indeed, it is his independence that dominates his intellectual and professional career. But in all the cases there is an independence and an early love of intellectual activity that I feel is an important common characteristic. Although in each person the facts of the matter are different, the specific manifestations of this general phenomenon differ from subject to subject.

Some, as Maslow or Rokeach, developed a trait of independence out of rejecting their familiar or religious environments. Others, Bruner in particular, were encouraged by their families to pursue independent and intellectual interests.

All of the subjects report introversive traits as children that reinforced their intellectual preoccupations. Some were more conscious of this, others realized only, as Skinner said, "when I was hit over the head with it." Few had a large group of friends, and in general, these also tended to be children with intellectual interests. Even McClelland, who reports the most social activity of the subjects, had cyclic periods of introversive isolation.

In a majority of the cases, there were physical factors that added to these feelings of apartness, difference. Bruner was blind for the first two years of his life. Maslow, almost entirely friendless as a child, thought of himself as an "ugly child" who was very tall and skinny. Simon, a Jew in a Christian community, was color-blind and left-handed. In two cases, Simon and Bruner, these factors are related to certain intellectual traits; in two they are more important in their social effects.

Although not all of the subjects were too familiar with the term, all of them, I think, would consider that they are more or less self-actualizing, at least professionally. Several made it clear that in their personal lives, scars left by their childhood environments made certain needs insatiable; but professionally speaking, and in terms of current situations, they can all be termed self-actualizing people. I am not sure that I would call them self-actualized in the way certain of Maslow's original subjects, say Ruth Benedict or

Max Wertheimer, probably were, but I feel that they do come under the umbrella of the term. They are all secure, economically and professionally; all seem to have warm, happy family lives; all have achieved prestige and esteem in their professions; and, I think, all are and have been actualizing their potentials in creative processes.

They all consider themselves creative. In fact, although only Maslow actually said this, I think they, too, would tend to define creativity in terms of themselves. But, as Rokeach pointed out, it is also important to realize that "people who aspire to be creative, have a need to think of themselves as creative... I have known people who are not creative to have (the experience of creativity)." What we shall have to ask is whether his next statement is true, namely, that "the experience is indistinguishable between creative thinking and non-creative thinking." While this question will be taken up in detail only in the next section, we can say something about it in the present context.

All of our subjects feel they are creative, if for no other reason than because, as Maslow put it, "I have created a lot, and I can whenever I have to." Their judgment rests not only on subjective feelings of creative processes but of having produced creative products. And this judgment is, I feel, largely, if not verifiably, a true one. For one thing, their inclusion in the sample was dictated by their creativity as reflected in identifiable products and professional estimation expressed in prestige and position. They also feel they are creative because of the nature of their creative processes, which is a more difficult and intuitive judgment. Our evaluation of these processes will be based on a degree of intuitive feelings, and a conceptualization, although a somewhat a priori one, of the nature of the creative process. Our subjects are productive; they are highly motivated, by a sense of destiny inter alia; they have rejected previous beliefs and formulated novel ones; in this they fulfill our definition criteria.

One further aspect of this which definition does not deal with is related to what Ann Roe meant when she observed about creative scientists that "only one trait stood out in common... a willingness to work hard and to work long hours" (quoted in Anderson, 1959, p. 244). What I am referring to, and I will deal with this again in relation to life goals, is that every one of the subjects feels that he is doing what he would most like to do. It is my belief that if one were to ask every person in America what they would do if they had their free choice of doing anything they wanted, that only a small minority would answer that they would prefer, with minor modification perhaps, to continue doing precisely what they are doing at the present. These happy few would, I am sure, be exactly those whom we would consider creative. It is these who transcend the dichotomy of work as opposed to play; and it is these, more importantly perhaps, who are able to be altruistic and socially useful while pursuing their most selfish personal interests. While they all might appreciate, and need to spend some time in relaxation, in restful pastimes, they do not desire, need, or use spare time in the way the majority of the population do. For them "vacation" is an almost meaningless term. Their important

activities are not work in the usual sense, for they are also play. It is these activities that define their personal identities and give them their human dignity, rather than position, wealth, power or prestige. For that reason, even where they may be department chairmen or fill other prestigious posts, I think they can honestly claim to be essentially uninterested in such matters, as can only those whose power and esteem needs have been satisfied, and who have moved up the hierarchy of needs to the level where their primary motives are self-actualizing ones.

One of the important steps in the creative process, as defined by many thinkers, (e.g. Hutchinson or Osborn), is that of "illumination." This refers to a sudden insight that follows a period of preparation, and even frustration, during which the ideas are "incubating" in the creator's head. This aspect has never been explained, at least to my satisfaction, by these writers. One thing which is clearly related to it, however, is that of the peak-experience (Maslow, 1962) which is also connected with the self-actualizing person's character. All of the subjects could report some such peak-experience relating to their professional life. I did not ask nor did they deal with such experiences in personal life, although they sometimes gave some information on this. But they all had experienced the joy and excitement of creative insight.

Only one subject reported an illumination of the really classical sort, in bed. Ever since Kekulé people have been looking for the great insight conveyed symbolically through the dream. But in my study only Simon could report such an experience. One night, after he had been working on two problems of identification and causality, he had an illumination. "I remember going to bed one night not knowing they were connected and waking up the next morning knowing they were connected."

Simon also reports an insight, which we can call a peak-experience, of a more normal sort. He had been working on a problem in computer simulation, without too much success. He went to New York, it was in October, 1955, he remembers, and was walking along Riverside Drive. "I was thinking about the problems. And suddenly I had just a clear picture of how and why it was we could do it. I felt pretty good for a while afterwards."

Maslow also reports a clear example of a peak-insight, in good classical fashion, on a train. Skinner, who did not in general feel that he had such moments, reported at least one very dramatic one. McClelland felt this way when five years' work on an intuitive hunch paid off as he had hoped. Bruner also reports such feelings in moments of insight, as does Rokeach. But in Rokeach's case there is something else, which we can use as a means of arriving at an interesting point.

In reporting that he did not get such peak-experiences from great social achievements or from nature, Rokeach explained, "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 something unclean about getting an experience of this order unless you work for it." I

think this is very interesting, not only in terms of Rokeach's personality.

When Ruth Benedict told Abraham Maslow (cf. Chapt. V above) that he was too Western, that he should try to be more Eastern, I think part of what she meant, and that he didn't understand at the time, was that the Western personality was too active, too concerned with active rather than passive experiences. Rokeach feels it is unclean somehow to receive a peak-experience passively, say from nature, or from LSD (and this is related, for me, to the current feelings of many people about the use of LSD and such drugs). Why? Because he hasn't worked for it. This has two implications.

Firstly, we have here what I would call the "Protestant Ethic of peak-experiences." It is entirely congruent with the strongly protestant, puritanic element in our culture for people to feel repelled by the sort of experiences afforded by nature, say, which are best experienced and appreciated in a passive rather than active fashion. Rokeach is the clearest case here, but not the only one. McClelland reports that he has such experiences, "the more sensuous types of pleasure from sights and scenes and smells and foods and sunsets and that sort of thing," primarily abroad. Why? "It seems that I have to get out of my puritanical, achievement-oriented framework and culture in order to have these feelings." This is what I mean. It is hard, if possible, for most Americans to be passive enough to have the more Tao-istic types of peak-experiences, in which they are not actively participating.

Similarly, when I asked the subjects whether they had "altruistic" peak-experiences, in which they are not actively participating, only Maslow could report such feelings. The impression was that in the social sphere, too, they felt too "puny," as Rokeach put it, to feel they were participating and have such a peak experience. I would hazard the opinion that this is a central factor in producing the phenomenon in American society of a large group of people with strong political and social convictions who are largely apathetic and uninterested in trying to get the sort of social justice and political reforms they would like. It is not enough to point out, for example, that in France or Italy, where students at least have been traditionally active in such things, there is a tradition that legitimizes and facilitates such movements—for America has a revolutionary history. I think that the puritanic, protestant need to feel effectively active has more to do with it. In other words, I think the lack of what I called the "altruistic peak-experience" is related to the general social and political apathy of most Americans.

Secondly, I think this has to do with religious feelings, though not in any traditional fashion. McClelland reports such feelings only outside his puritanic framework, but I think this might be related to a religious feeling none of the others report. He is a Quaker and has, I feel, a deep feeling of community and social interest; and I think this is a factor which allows him to have such experiences; if only abroad. Maslow is the only subject who reports this type of experience, the Tao-istic peak-experience, as being common and important. Both from nature and art—music, dancing, etc., and from triumphs of social justice and seeing examples of devotion in other people. And he is also, I feel,

the only one who is deeply religious. I think he is religious but not theistic, in a very profound way which is something of a compromise between the Western character and the Eastern Tao-istic way of feeling. His religion, to call it such, is both an appreciation of the natural world and a deep humanistic social interest. And, moreover, I think this humanistic religiosity is expressed in his psychological view of human nature.

Every one of our subjects feels that his life goals have not only been fulfilled, but far beyond his early expectations and ambitions. They are grateful that they have been able to do the work that they have wanted to do and achieved security and happiness in doing this. They feel that they are very fortunate. None would make a wish for something qualitatively different from anything they currently have. I think that this is very important in the sense indicated above when we saw that they are doing what they most want. A person who has been able to be creative in his professional work, and has been recognized by his colleagues, and rewarded both financially and socially to a sufficient extent, is indeed a fortunate person. But I do not think that the sense of fulfillment is one that derives from a sort of resignation in which people tend to lower their aspiration level and narrow their interests in order to feel fulfilled. I believe that the ambitions they had have been fulfilled, more than fulfilled, and that their aspirations, far from narrowing down to suit reality, have gone higher all the time. They have not rested on their laurels but gone further than they ever thought they could have and continue right on going. This continual progress is not motivated, I think, by a fear of never achieving a secure position; rather, it grows out of the inner necessities of their creative work and out of the never ending need to self-actualize.

Six different people have, of course, six distinct and different backgrounds and personalities. But I think we have seen that these six share many common characteristics, while they differ in many important ways. It is a fair conclusion, I feel, that they are "creative" personalities and that the possible definitions of creative personalities would not be very dissimilar from the portraits drawn in the above case-studies.

The creative process

There were two conceptualizations of the creative process which were utilized in this study. One was a definition of the creative process derived from a number of theories of creativity and creative personalities and which attempted to achieve a certain clarification and integration in a unitive formulation (cf. Chapter I above). The other was an attempt to spell out some of the characteristics of the thought processes that were indicated by various theories of cognition and creativity; this was used in the interview to suggest to the subjects various possible categories in which to respond and formed the last part of the interview outline (cf. Chapter II, sections III, IV & V). After the research has been done and the case studies presented, what can be said about the creative process in general, and in these six cases in particular?

One thing we must be aware of is the danger of using theoretical models that restrict perception and cognition, and exclude important factors. We always tend to find what we look for. For this reason I did not include my tentative definition in the interview outline. But the danger still remains; and in the following, as I attempt to deal with the subjects in the light of a theoretical framework, there is a great possibility that I shall deform and limit the information and opinions of the study. I only hope that the inner necessities of the data will prevail over such dangers; limitations inherent in the data themselves, due to my set and the sets of my subjects, will be for others to deal with.

The most striking common characteristic of the creative processes reported is one which supports, in essence, the definition I have been using. This characteristic is much like what MacLeod is referring to when he talks about "the 'restructuring of the cognitive field'—a cumbersome expression perhaps, but less unsatisfactory than many" (1962, p. 188). This concept, which derives from Wertheimer in particular, is one of the most important ones, I think, in understanding the creative process. MacLeod makes a good point about this:

> When we think creatively we shake ourselves loose from our old assumptions, we see the problem as imposing new requirements, we see old instruments as capable of new functions—the rigid structure of the field has been broken down to permit new configurations. From this point of view it is obvious that wherever restructuring takes place there is the possibility of creative thinking... I should be inclined, however, to include a value dimension and reserve something like "true creativity" for the act which has resulted in a radical restructuring of a major cognitive or motivational system. The "truly creative" person is the person who has "seen the light," has experienced a flood of illumination on a problem or concern with which he is deeply involved, and has thoroughly reoriented his thinking as a result (1962, p. 189).

It is primarily in this regard that I feel this research has illuminated the creative process. All of the subjects accomplished their creative achievements through a process of restructuring the field of the problems they were concerned with. And, to less or greater extents, they formulated paradigmatic questions, the implications of which, followed out in their work, led to novel and significant views of various aspects of human nature. Whether they illuminated and restructured the nature of achievement motivation, of cognitive development, or went as far as to evolve comprehensive theories of human nature, they share this common accomplishment of paradigmatic re-centering. But there are two further aspects of the process of formulation and research that have been reported in the case-studies.

> The role of merely subjective interests of the self is, I think, much overestimated in human actions. Real thinkers forget about themselves in thinking. The main vectors in genuine thought often do not refer to the I with its personal interests; rather they reflect the structural requirements of the given situation. Or when such vectors do refer to the I, this is not just the I as center of subjective striving. Of course, the transition may also lie in the direction of the deeper requirements of the I itself. Sometimes there is a happy coincidence between the requirements of the situation which represents the problem and the real, the deeper needs of the I (Wertheimer, 1959, p. 180).

I would maintain, and this is the first and perhaps the most important conclusion I see from this research, that it is precisely in those situations where the subjective needs of

the creative personality coincide with the requirements of the situation, that the sort of creative process we are considering will emerge. It is for this reason that I would say the subjects in this research have demonstrated self-actualization in their creative work.

In one of the case-studies, that dealing with Milton Rokeach, I attempted to show the manner in which the significant question that he asked and which became, in its implications and scope, a paradigmatic one was a question stemming from the important concerns of his individual personality and life-history. I think that this is true of all of the subjects, although not in so clear a fashion. And, moreover, I feel this is true even where, as with McClelland, the initial choice of a problem was dictated by accidental and pragmatic considerations.

Simon has described three stages in problem-solving activity. These are the identification of problem areas and the choice of a particular problem to be solved; the generation of possible solutions; and the choice and testing of a particular solution. It is my belief that in truly creative thought the perception of a problem, and the choice of a problem to work on, will be particularly determined by the self-actualizing, inner-directed requirements of the creative personality. And, moreover, because I believe, with Adler, in the essential social interest of the creative thinker, I think that the problem chosen for these subjective reasons will be one of general social significance and, hence, socially valuable. The highly neurotic person will deal with highly subjective things, but these will rarely be socially valuable. The highly creative will solve problems that are important to him personally but will at the same time and by the same actions contribute to his society. In this transcendence of the selfish-altruistic dichotomy we have what Benedict would call the highly synergic nature of the creative process. It is the sense of personal as well as social significance which provides the motivational drive and willingness to work hard and intensively noted by Rokeach, Simon, Roe and others. As Maslow says, in the 12th century people would not have hesitated to apply the term "saint" to such people. But whereas they would refer to work done for the greater glorification of God, or out of self-denying altruism, we can view this as motivated by deep self-actualizing needs as well as social interest.

My feeling that this is true of all my subjects is not one that can easily be demonstrated. Rokeach is, of course, a clear example. In Bruner's case we can point to the frustrations of his early education and his great intellectual curiosity. In McClelland's to a radical Protestant background and a sense of community. In Maslow's to a need to find good, kind, almost parental figures and to understand the meaning of their goodness. In Skinner's to a desire to find the rules of behavior that permit control and direction of this behavior, for whatever reasons. In each case it is my feeling, however unsubstantiated, that the choice of problem is dictated by inner necessities of the creator's personality. And this leads me to the second of the major conclusions I wish to draw.

> The notes, data, and publications which I have examined do not show that I ever behaved in the manner of Man Thinking as described by John Stuart Mill or John Dewey or in reconstructions of scientific behavior by other philosophers of science (Skinner, 1959, p. 89).

Every one of our subjects made it very clear that they never had proceeded in their research by using the hypothetico-deductive model of scientific research as formulated by such people as R. A. Fisher and as taught in many graduate schools. To use a phrase that occurred in almost every one of the interviews, they were just following their noses. And this is demonstrated best in the methods they used.

When a person is pursuing a line of inquiry that is based, consciously or not, on a question that transcends the accepted conceptual and instrumental framework, he will be forced to generate novel methods and instruments as well as theories. This is characteristic of research which is exploring, in Maslow's term, "the frontiers of knowledge."

> Sometimes it happened that Einstein was faced with the difficulty that the mathematical tools were not far enough developed to allow a real clarification; nonetheless he would not lose sight of his problem and would often succeed in finding a way eventually, in which the seemingly insuperable difficulties could be surmounted (Wertheimer, 1959, p. 233).

All of the subjects, in pursuing their paradigmatic questions of the derived sub-problems, invented, without usually realizing it, new instruments and methods of investigation. Having asked questions that could not be asked within the accepted conceptual framework, they needed methods not included in the accepted instrumental framework. And just as they often were unaware of the radical implications of their questions, they frequently did not realize the novelty and value of their technical innovations. "I invented methods by the dozens without realizing it, I was so absorbed" (Maslow). And many of these have become standard, at least for those who are now settling the territories they pioneered. To name just one example, Skinner developed, as we have seen above, the methods of cumulative recording, various schedules of reinforcement, and the notorious "Skinner box."

It is partly for these reasons that many of the subjects, Maslow in particular, have been accused at one time or another of being "methodologically unsophisticated" or merely sloppy. But in most cases, even while making technical innovations of creative significance, the subjects have still tried to use methods that were rigorous and quantifiable in the traditional sense. Maslow here is the prime exception, but then he has also been working further outside the accepted framework than any of the others. When one asks questions never asked before, or when one attempts to answer old questions in ways never attempted before, one will necessarily use methods never used before. For this reason none of the subjects, however systematically they pursued their problems, ever used the traditional experimental methods Skinner refers to as "formalized scientific practice," either prospectively or retrospectively. I think this is also related to the usefulness of broad preparation and general knowledge and of the ability to endure a looseness of structure, an ambiguity in conceptualization of the sort emphasized by Skinner, McClelland, Maslow, Simon and Wertheimer. Skinner makes the point nicely:

> If I were to conclude that crackpot ideas are to be encouraged, I should probably be told that psychology has already had more than its share of them. If it has, they have been entertained by the wrong people. Reacting against the excesses of psychological quackery, psychologists have developed an enormous concern for scientific respectability. They constantly warn their students against questionable facts and unsupported theories. As a result the usual Ph.D. thesis is a model of compulsive cautiousness, advancing only the most timid conclusions thoroughly hedged about with qualifications. But it is just the man capable of displaying such admirable caution who needs a touch of uncontrolled speculation (Skinner, 1960, p. 36).

The next point I wish to make about the creative process is related to these last two. By claiming that these thinkers have asked significant questions which have, in the working out of derived problems and implications, turned out to be paradigmatic re-centerings of their field, I am implying that they have produced systematic reformulations of areas of thought in psychology. Such a conclusion is justified only in retrospect. I say this even though I think it is clearly justified. Bruner has developed theories which present a novel and comprehensive view of cognitive development and the process of education. McClelland has evolved a theory of the nature and effect of the need to achieve that he claims will prove the hypothesis "that a particular psychological factor—need for Achievement—is responsible for economic growth and decline" (1962, p. vii). He has reformulated, not psychological theory so much, as the theory of economic growth. Simon has arrived at a theory of human thinking so comprehensive in its implications that he claims to be able to prove that "all human cognition is decision making" and of the sort explained by his theory. Rokeach, starting with the question of human beliefs, has ended up with a theory of belief systems that allows him "to talk about anything in psychology. I started off by asking a question that has to do with somebody trying to make me believe something (Notice the personal element here) and I end up asking questions that are related to all of personality, attitude organization, and cognitive phenomena." But Maslow and Skinner are the best examples.

Curiously enough, it is the two subjects who are probably furthest from each other in the tone and nature of their psychological viewpoints who are also most similar, I think, in the manner in which they arrived at their viewpoints. This is, I think, a case of structure vs. content of the sort implied when Rokeach speaks of the essential similarity of a fascist and a communist, without any of the authoritarian implications of the analogy.

Skinner started out by looking for some sort of lawful processes in the behavior of organisms. He was relying on the belief of Loeb and Crozier, Pavlov and Watson, that behavior could be described and analyzed objectively, without having to postulate any physiological or psychological determinants that could not be scientifically verified. We have seen how he progressed from one problem to another, never losing sight of the main goal, each time advancing one more step, in method or theory, towards his goal. But only after he was there did he stop and realize the nature of the path taken. His course was not charted before embarking, but navigated as he went along, according to the reefs

and the clear passages he found, and guided only by the one star of his ultimate goal. Only later could he formulate accurate maps for the territory conquered. His systematic theory was a retrospective one, and is still unformulated in all of its implications. This is what he is currently occupied with, in his book on teaching and the projected one on the design of cultures; this is what he would consider "a reasonable pattern for one's intellectual life." This is what he means, I think, when he says "If I could have seen in 1928 where I am now, it would have been precisely what I wanted to do at that time. I have been very lucky in being able to follow up and develop along lines that I wanted to follow. I have never shifted my course at any point." A person who sets out with a very clear idea of where he will end up will, I think, not go very far. Columbus, we recall, expected to discover a route to India, and we all may be grateful that his achievements exceeded his expectations.

Maslow started out by trying to integrate the views of Freud, Adler, Fromm, and Horney into a general view of psychopathology. He felt that they were all right, but it was necessary to achieve some higher integration, for each stressed different parts of the elephant. But this was only the beginning. Other influences became important. He appreciated the holistic-organismic way of looking at things, as well as the psychodynamic; and the whole he ended up with was much more than the sum of its parts. The next step came about through wondering about the personalities of several persons he was very impressed with, yet it also reflected the inner necessities of the problems he was posing. The progression from asking, "what makes people neurotic?" to the question of human health and the highest potentials of human nature, was a slow one but guided by personal needs and the structural requirements of the situation. He has not yet finished constructing the "comprehensive, systematic and empirically based general psychology and philosophy which includes both the depths and the heights of human nature" (1962a, p. iv). Perhaps he may never achieve this in his lifetime. But the work of producing a Summa Theologica is of necessity the work of maturity, just as it is proper to youth to venture out of the safe, conquered areas into the uncharted realms of nature and ask the unthinkable questions. But it is only at the top of the mountain that one may look back on the intricate path one has taken to scale the height. Only on the return trip, gathering up the thread he had let out on his way in, could Theseus see clearly the involutions of the labyrinth he had penetrated.

Finally, I would like to stress once more the ultimate interrelation of the nature of the creative personality and the creative process that will result in products both novel and significant. It is only in asking questions arising from the preoccupations of a unique personality, and from unique confrontations with the world, and the seeking of answers to these questions with methods arising from the nature of the problems and not from traditional practice, that something truly creative is done, that paradigmatic restructurings of the intellectual field are achieved; and only these are ultimately of outstanding

social value and radical significance. For this reason Adler can say "Mankind only calls those individual geniuses who have contributed much to the common welfare. We cannot imagine a genius who has left no advantages to mankind behind him."

But I make this statement without having to claim that any of these systematic reformulations will remain as permanent theories of human nature traditional in their own light. New generations of creative thinkers will come along and violate these belief systems and even destroy them. Any theory, once it has been systematically formulated, has lost its essential characteristic of adaptability to new problem situations and will die like a dinosaur when it is unable to evolve and meet new conditions. But this is precisely the important reason why these theories are only retrospective, why neither Maslow nor Skinner nor any of the others formulated their theories before investigating their problems. Why they can use hypothetic-deductive models only after accumulating their results. However, the fact that any theory, once systematized, "is a sitting duck for another theory that will come along, notice the weakness, and build upon it, avoid these weaknesses and develop a superior theory" (Rokeach) is less important than the fact that such theories are necessary and important steps in the advancement and progress of science and that their formulation is one of the important activities of the creative thinker.

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psychology/communication

Before arriving in the field of communication, Larry Gross was a psychology student at Brandeis University; *Creativity: Process and Personality* was Gross's undergraduate thesis at Brandeis, completed in 1964. This mediastudies.press edition is the initial publication of that undergraduate thesis, with a new preface by Gross himself. Creativity: Process and Personality finds Gross exploring the nature of creativity by interviewing some of the era's most noteworthy experts in psychology, including Herbert Simon, Milton Rokeach, Abraham Maslow, David McClelland, Jerome Bruner, and B. F. Skinner. The result of Gross's interviews is a nuanced and multi-perspectival set of interlocking chapters, each of which probes the psychological, social, and cultural aspects of creativity. *Creativity: Process and Personality* remains a provocative consideration of how creativity takes form, while also operating as a revealing snapshot of mid-twentieth century psychological thought.

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