

### *The Creative Phases*

Science has its inception in a particular person who is pursuing aims, values, purposes, which have personal and subjective meaning for him. As a part of this pursuit, he, in some area, "wants to find out." Consequently, if he is to be a good scientist, he immerses himself in the relevant experience, whether that be the physics laboratory, the world of plant or animal life, the hospital, the psychological laboratory or clinic, or whatever. This immersion is complete and subjective, similar to the immersion of the therapist in therapy, described previously. He senses the field in which he is interested. He lives it. He does more than "think" about it—he lets his organism take over and react to it, both on a knowing and on an unknowing level. He comes to sense more than he could possibly verbalize about his field, and reacts organismically in terms of relationships which are not present in his awareness.

Out of this complete subjective immersion comes a creative forming, a sense of direction, a vague formulation of relationships hitherto unrecognized. Whittled down, sharpened, formulated in clearer terms, this creative forming becomes a hypothesis—a statement of a tentative, personal, subjective faith. The scientist is saying, drawing upon all his known and unknown experience, that "I have a hunch that such and such a relationship exists, and the existence of this phenomenon has relevance to my personal values."

What I am describing is the initial phase of science, probably its most important phase, but one which American scientists, particularly psychologists, have been prone to minimize or ignore. It is not so much that it has been denied as that it has been quickly brushed off. Kenneth Spence has said that this aspect of science is "simply taken for granted."<sup>1</sup> Like many experiences taken for granted, it also tends to be forgotten. It is indeed in the matrix of immediate personal, subjective experience that all science,

and each individual scientific research, has its origin.

### *Checking with Reality*

The scientist has then creatively achieved his hypothesis, his tentative faith. But does it check with reality? Experience has shown each one of us that it is very easy to deceive himself, to believe something which later experience shows is not so. How can I tell whether this tentative belief has some real relationship to observed facts? I can use, not one line of evidence only, but several. I can surround my observation of the facts with various precautions to make sure I am not deceiving myself. I can consult with others who have also been concerned with avoiding self-deception, and learn useful ways of catching myself in unwarranted beliefs, based on misinterpretation of observations. I can, in short, begin to use all the elaborate methodology which science has accumulated. I discover that stating my hypothesis in operational terms will avoid many blind alleys and false conclusions. I learn that control groups can help me to avoid drawing false inferences. I learn that correlations, and *t* tests and critical ratios and a whole array of statistical procedures can likewise aid me in drawing only reasonable inferences.

Thus scientific methodology is seen for what it truly is—a way of preventing me from deceiving myself in regard to my creatively formed subjective hunches which have developed out of the relationship between me and my material. It is in this context, and perhaps only in this context, that the vast structure of operationism, logical positivism, research design, tests of significance, etc., have their place. They exist, not for themselves, but as servants in the attempt to check the subjective feeling or hunch or hypothesis of a person with the objective fact.

And even throughout the use of such rigorous and impersonal methods, the important choices are all made subjectively by the scientist. To which of a number of hypotheses shall I devote time? What kind of control group is most suitable for avoiding self-deception in this particular research? How far shall I carry the statistical analysis? How much credence may I place in the findings? Each of these is necessarily a subjective personal judgment, emphasizing that the splendid structure of science rests basically upon its subjective use by persons. It is the best instrument we have yet been able to devise to check upon our organismic sensing of the universe.

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<sup>1</sup> It may be pertinent to quote the sentences from which this phrase is taken. ". . . the data of all sciences have the same origin—namely, the immediate experience of an observing person, the scientist himself. That is to say, immediate experience, the initial matrix out of which all sciences develop, is no longer considered a matter of concern for the scientist. He simply takes it for granted and then proceeds to the task of describing the events occurring in it and discovering and formulating the nature of the relationships holding among them." Kenneth W. Spence, in *Psychological Theory*, M. H. Marx (Ed.), Macmillan, 1951, p. 173.

### *The Findings*

If, as scientist, I like the way I have gone about my investigation, if I have been open to all the evidence, if I have selected and used intelligently all the precautions against self-deception which I have been able to assimilate from others or to devise myself, then I will give my tentative belief to the findings which have emerged. I will regard them as a springboard for further investigation and further seeking.

It seems to me that in the best of science, the primary purpose is to provide a more satisfactory and dependable hypothesis, belief, faith, for the investigator himself. To the extent that the scientist is endeavoring to prove something to someone else—an error into which I have fallen more than once—then I believe he is using science to bolster a personal insecurity, and is keeping it from its truly creative role in the service of the person.

In regard to the findings of science, the subjective foundation is well shown in the fact that at times the scientist may refuse to believe his own findings. "The experiment showed thus and so but I believe it is wrong," is a theme which every scientist has experienced at some time or other. Some very fruitful scientific discoveries have grown out of the persistent *disbelief*, by a scientist, in his own findings and those of others. In the last analysis he may place more trust in his total organismic reactions than in the methods of science. There is no doubt that this can result in serious error as well as in scientific discoveries, but it indicates again the leading place of the subjective in the use of science.

### *Communication of Scientific Findings*

Wading along a coral reef in the Caribbean this morning, I saw a blue fish—I think. If you, quite independently, saw it too, then I feel more confidence in my own observation. This is what is known as intersubjective verification, and it plays an important part in our understanding of science. If I take you (whether in conversation or in print or behaviorally) through the steps I have taken in an investigation, and it seems to you too that I have not deceived myself, and that I have indeed come across a new relationship which is relevant to my values, and that I am justified in having a tentative faith in this relationship, then we have the beginnings of Science with a capital S. It is at this point that we are likely to think we have created a body of scientific knowledge. Actually there is no such body of knowledge. There are only tentative beliefs, existing subjectively, in a number of different persons. If

these beliefs are not tentative, then what exists is dogma, not science. If on the other hand, no one but the investigator believes the finding, then this finding is either a personal and deviant matter, an instance of psychopathology, or else it is an unusual truth discovered by a genius, which as yet no one is subjectively ready to believe. This leads me to comment on the group which can put tentative faith in any given scientific finding.

### *Communication to Whom?*

It is clear that scientific findings can be communicated only to those who have agreed to the same ground rules of investigation. The Australian bushman will be quite unimpressed with the findings of science regarding bacterial infection. He knows that illness truly is caused by evil spirits. It is only when he too agrees to scientific method as a good means of preventing self-deception, that he will be likely to accept its findings.

But even among those who have adopted the ground rules of science, tentative belief in the findings of a scientific research can only occur where there is a subjective readiness to believe. One could find many examples. Most psychologists are quite ready to believe evidence showing that the lecture system produces significant increments of learning, and quite unready to believe that the turn of an unseen card may be called through an ability labeled extrasensory perception. Yet the scientific evidence for the latter is considerably more impeccable than for the former. Likewise when the so-called "Iowa studies" first came out, indicating that intelligence might be considerably altered by environmental conditions, there was great disbelief among psychologists, and many attacks on the imperfect scientific methods used. The scientific evidence for this finding is not much better today than it was when the Iowa studies first appeared, but the subjective readiness of psychologists to believe such a finding has altered greatly. A historian of science has noted that empiricists, had they existed at the time, would have been the first to disbelieve the findings of Copernicus.

It appears then that whether I believe the scientific findings of others, or those of my own studies, depends in part on my readiness to put a tentative belief in such findings.<sup>2</sup> One reason we

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<sup>2</sup> One example from my own experience may suffice. In 1941 a research study done under my supervision showed that the future adjustment of delinquent adolescents was best predicted by a measure of their realistic self-understanding and self-acceptance. The instrument was a crude one, but it

are not particularly aware of this subjective fact is that in the physical sciences particularly, we have gradually agreed that in a very large area of experience we are ready to believe any finding which can be shown to rest upon the rules of the scientific game, properly played.

*The Use of Science*

But not only is the origin, process, and conclusion of science something which exists only in the subjective experience of persons—so also is its utilization. "Science" will never depersonalize, or manipulate, or control individuals. It is only persons who can and will do that. This is surely a most obvious and trite observation, yet a deep realization of it has had much meaning for me. It means that the use which will be made of scientific findings in the field of personality is and will be a matter of subjective personal choice—the same type of choice as a person makes in therapy. To the extent that he has defensively closed off areas of his experience from awareness, the person is more likely to make choices which are socially destructive. To the extent that he is open to all phases of his experience we may be sure that this person will be more likely to use the findings and methods of science (or any other tool or capacity) in a manner which is personally and socially constructive.<sup>3</sup> There is, in actuality then, no threatening entity of "Science" which can in any way affect our destiny. There are only people. While many of them are indeed threatening and dangerous in their defensiveness, and modern scientific knowledge multiplies the social threat and danger, this is not the whole picture. There are two other significant facets, (a) There are many other persons who are relatively open to their experience and hence likely to be socially constructive. (b) Both the subjective experience of psychotherapy and the

scientific findings regarding it indicate that individuals are motivated to change, and may be helped to change, in the direction of greater openness to experience, and hence in the direction of behavior which is enhancing of self and society, rather than destructive.

To put it briefly, Science can never threaten us. Only persons can do that. And while individuals can be vastly destructive with the tools placed in their hands by scientific knowledge, this is only one side of the picture. We already have subjective and objective knowledge of the basic principles by which individuals may achieve the more constructive social behavior which is natural to their organismic process of becoming.

This excerpt (pp.275-277) is taken from:

Rogers, C.R. (1955). Persons or science? A philosophical question. *American Psychologist*, 10, 267-278.

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was a better predictor than measures of family environment, hereditary capacities, social milieu, and the like. At that time I was simply not ready to believe such a finding, because my own belief, like that of most psychologists, was that such factors as the emotional climate in the family and the influence of the peer group were the real determinants of future delinquency and nondelinquency. Only gradually, as my experience with psychotherapy continued and deepened, was it possible for me to give my tentative belief to the findings of this study and of a later one (1944) which confirmed it. (For a report of these two studies see "The role of self understanding in the prediction of behavior" by C. R. Rogers, B. L. Kell, and H. McNeil, *J. Consult. Psych.*, 1948, 12, 174-186)

<sup>3</sup> I have spelled out much more fully the rationale for this view in two recent papers: "The concept of the fully functioning person" (unpublished manuscript), and "Toward a theory of creativity," *ETC*, 1954, 11, 249-260.