

III

EXPERIENCE IN THE LIGHT OF RECENT PSYCHOLOGY: CIRCULAR RESPONSE

THE principle of integrating interests is not yet sufficiently recognized and acted on by jurists and economists, the principle of integrating *power* is not sufficiently acknowledged by political scientists. But while many political scientists and economists as well as statesmen and labor arbitrators have stuck to the theory of the balance of power, of the equilibrium of interests, yet life continually escapes them, for whenever we advance we slip from the bondage of equilibrium.

This view, which springs so insistently to the eye with every fresh study of social situations, is supported by our recent psychology which is giving us more than hints of a truth that may mean large changes for politics, economics and law. The heart of the truth about integration is the connection between the relating of two activities, their interactive influence, and the values thereby created. This chapter will be devoted to a consideration of that point, or rather to the contribution of psychology on this point; a separate chapter (IX) will take up, chiefly by illustration, what the study of social situations yields on the subject of integration as the creative principle.

Progressive experience, I say, depends on the relating. The ardent search for objectivity, the primary task of the fact worshippers, cannot be the whole task of life, for objectivity alone is not reality. The crux of philosophical controversy we have seen mirrored everywhere. As the subjective idealists have overemphasized the subject, and the realists, the object, so there are the historians who deny “economic determinism” and those who give it more than its place; there are the political scientists who talk of “the will of the people” and those who, in reaction to “empty will,” give us the “objective situation” as always our ruler; there are the jurists who exaggerate abstract conceptions and those who see all truth in “social facts.” In the arts, especially in painting, the swing of the pendulum between “subjectivity” and “objectivity” is most interestingly apparent. In psychology we have the introspectionists and the behaviorists.

I do not see how such opposing tendencies can be avoided while we see reality either in subject or in object; I do not see how we can run fast enough from one to the other to keep ourselves within the region of truth. But our latest psychology is taking a step beyond this and putting itself in line with the oldest philosophy. Holt,¹ more clearly perhaps than any other recent writer, has shown us that reality is in the relating, in the activity-between.² He shows us

1 Edwin B. Holt: *The Freudian Wish, The Place of Illusory Experience in a Realistic World* (one of the studies in *The New Realism*), *The Concept of Consciousness*. I have also had the privilege of reading some of Dr. Holt's unpublished lectures as taken down by students. There are undoubtedly many things in this book with which Dr. Holt would not agree, some inferences which he might think mistaken, but I have given what for me are the implications of his thought.

2 *The New Realism*, p. 366, he defines reality as “some very comprehensive system of terms in relation.” He expresses this more actively later, although nowhere explicitly as a definition of reality. In fact the word reality is now very little used; it does not fit in with our present mode of thinking.

how in the “behavior-process” subject and object are equally important and that reality is in the relating of these, is in the endless evolving of these relatings. This has been the grain of gold of the profoundest thinkers from Aristotle to the present day. Of course the object is not created by the percipient; of course the subject is no more “a mere reflex arc” than it is an evangelical soul; nor are subject and object “products” of a vital force. For a century, roughly speaking, objective idealism has given us—its innermost truth—existence as unitary experience which upon analysis resolves itself into the two great generic differings which have been called subject and object. Now physiologists and psychologists in their treatment of response are approaching this view.

The present psychological treatment of response, by emphasizing “the total situation,” happy phrase showing the importance of the outer object or situation as constituent of the behavior process, is extraordinarily interesting to students of social research. Add to the total situation what might be called the evolving situation, as hinted in Holt’s formula and clarified by him in other places, and you have an important contribution to the social sciences. This formula defines behavior as a function of environment and identifies thought (purpose, will) with that function. The use of the mathematical term function has many suggestive implications. For instance, this definition of behavior, taken with the rest of this writer’s teaching, implies the possible reciprocal influence of subject and object, or to keep to the language of the mathematical analogy,

implies that the variables of this formula *may* be interdependent, either being a function of the other.³ He does, it is true, in one place speak of environment as if it were always an independent variable,⁴ and that would make his formula inapplicable for what we see in most social situations; industrial conditions are influencing the behavior of trade unions while the behavior of trade unions is influencing industrial conditions. But while Holt uses the words “object” or “object of environment” continually, he often uses also “situation,” “event,” “process,” and with these words it becomes more obvious that the “object” is being influenced by the “subject” while the “subject” is being influenced by the “object.” Moreover, in the illustration he gives of the girl discriminating between different plays, he says that her choice influences “the sound moral development of the institution itself.”⁵ Here the theatre is not an independent but one of two interdependent variables. When we are employing this formula, therefore, we have to decide in the case

3 Perhaps an illustration, although it may be only roughly accurate, would make this clearer. Take the European situation and a gold mine in America. The European situation and the amount of gold taken out of the mine are two interdependent variables either one of which may be taken as a function of the other. The European situation will vary according to the amount of gold taken out, that is, it “depends” on it, and it is equally true the other way around, for the total amount of gold taken out will depend somewhat on the European situation. Increase the birth-rate in Europe and more gold will be taken out at Nome. If, however, we should be speaking not of the actual amount of gold taken from the mine, but of the percentage per ton of gold in quartz in a mine, the matter is quite different. The European situation is affected by the variation in this percentage, but the percentage varies quite independently of the European situation; increase the birth-rate in Europe and you do not increase the percentage per ton. We have no longer two interdependent variables; the percentage of gold per ton is an independent variable of which the European situation is a function.

4 *The Freudian Wish*, p. 95.

5 *Op cit.*, p. 124.

in hand whether environment is an independent or one of two interdependent variables—it is in each case a question of observed fact.

The interweaving of the different factors of the evolving situation sometimes takes place so rapidly before our eyes as to make the process very plain. On a Wage Board, one year, we were up against an interesting objective situation: a drop in prices, indications of unemployment, and at the same time a demand for higher wages in that particular industry. In anticipation of the proposed heightened wage scale which our Board was to effect, some employers were turning off their less efficient workers. We had to ask each week the changes in that respect in the objective situation; those changes had been brought about by the trend of our deliberations, but also our deliberations were very much affected by these changes. We saw that it would be a disadvantage to the employees as well as to employers to have the minimum wage too high, since we had evidence in the actual situation, not mere threats, that that would mean a certain amount of unemployment.

This reciprocal influence, this evolving situation, fundamental for politics, economics and jurisprudence, is made clearer if for the words thought, purpose, will in a description of the behavior process, we substitute thinking, purposing, willing. It is not thought which Watson is writing about, but thinking, for surely Watson if anyone gives us thinking as a process. As long as we use the word thought there is a tendency to think that bodily mechanisms are the expression, the organs, of thought, whereas they are thought, or rather, they are thinking. Again, there is a tendency to con-

ceive of thought as the thing we have left over when we have finished thinking, the thing which thinking produces. All static expressions should be avoided. Integrated organism (one psychologist speaks of "the completely integrated organism") is unfortunate, for the organism is the continuing activity of self-organizing, self-maintaining. We must be careful of the "eds" because they lead to "wholes," the wrong kind of wholes, the "influence of the whole on the parts," etc.⁶ Such expressions as "coordinated wholes" are seen in the writings of some of the behaviorists, but, unless explained, seem against the very truth which behaviorism is trying to stand for. An "-ed" becomes a stopping place to thought, and when man cannot think any further it is dangerous. God has been to many races and to many individuals the place where thinking stops, as mind is often "the sanctuary of ignorance."

To return to our consideration of the behavior process, Holt has made his formula clear by a description of the working of two laws: one from physiology, one from physics. First he has shown us the importance of the physiological law that when a muscle contracts,⁷ the sense-organ in that muscle is stimulated so that there is an almost simultaneous afferent nerve impulse from the muscle back to the centre, and thus a circular reflex is established. Hence the contraction of the muscle is only in a certain sense "caused" by the stimulus; that

6 I have tried to show in Chap. V when and how I think it is legitimate to use this expression.

7 A sense organ has been stimulated, the energy of stimulation has been transformed into nervous energy, this nervous energy has passed along an afferent nerve to the central nervous system and has passed through this and out by an efferent or motor nerve to a muscle where the energy is again transformed and the muscle contracts.

very muscular activity is itself in part producing the stimulus which “causes” the muscular activity. Holt’s estimate of the value of the circular reflex appeared in his Harvard lectures in 1917, perhaps earlier also, but as they have not been published I quote from Bok, although Bok’s article came out at a later date. I quote at some length because I wish in a later chapter, in speaking of the political process, to recall the circular reflex as a law which observation shows us as operating on infra-personal, personal and social levels.

“The reflex arc is the path of the stimulations received in consequence of a function of the individual itself...” “This view does not start from the function of the receptor, but just from the action of the effector, which sounds strange at first, since we are accustomed to look upon the action of the effector as a result only of irritation in the receptor...” “On a visual stimulation the animal must react with a movement which alters the visual stimulations...in other words, so that the attitude very specifically changes with regard to the stimulation given. Thus the reflex-reaction must alter the perception of the reflex-stimulus: in other words, it must very specifically alter the relation of the animal towards that specific stimulus, it must ‘respond’ to that stimulus.”⁸

This will throw much light on the interdependent variables of the formula given above when we come to use that formula for social psychology, whether one thinks of it only as an analogy or as the operation of

8 S.T. Bok, *The Reflex-Circle*, in *Psychiatrische en Neurologische Bladen*, Amsterdam, Juli-Augustus, 1917. See also James, *Principles of Psychology*, II, 582, and Baldwin’s *Mental Development in the Child and the Race*, 2nd ed., pp. 133, 263 ff., 374 ff.

the same law on different levels. We shall see that the activity of the individual is only in a certain sense caused by the stimulus of the situation because that activity is itself helping to produce the situation which causes the activity of the individual. In other words behavior is a relating not of "subject" and "object" as such, but of two activities. In talking of the behavior process we have to give up the expression act "on" (subject acts on object, object acts on subject);⁹ in that process the central fact is the meeting and interpenetrating of activities. What physiology and psychology now teach us is that part of the *nature* of response is the change it makes in the activity which caused so-to-speak the response, that is, we shall never catch the stimulus stimulating or the response responding. The importance of this cannot be overestimated. Stimulus is not cause and response the effect. Some writers, while speaking otherwise accurately of the behavior process, yet use the word result—the result of the process—whereas there is no result *of* process but only a moment *in* process. Response is not merely the activity resulting from a certain stimulus and that response in turn influencing the activity; it is *because* it is response that it influences that activity, that is part of what response means. Cause and effect, subject and object, stimulus and response: these are now given new meanings. All the possibilities of connections in the neural pathways which we are now beginning to suspect, or rather to have evidence of through the work

9 This has important consequences for psychology, for as long as we thought of matter as something "acted on" we inevitably thought of sensory experimentation," etc., in a certain way. A truly dynamic psychology, by giving us both environment and ourselves as activity, has implications which have not begun to be unfolded yet.

of Pawlov, Bechterew, etc., have new light thrown on them by this approach to response. On the social level, cause and effect are ways of describing certain moments in the situation when we look at those moments apart from the total process.

In the behavior process then we see the interlocking of stimulus and response, a self-sufficing process. Here is no taint of the psychological fallacy which held the results of mere abstraction as primary *Dinge an sich*. We get completely away from the fallacy which dissected experience and took the dead products, subject and object, and made them the generating elements. The most valuable part of this teaching is that the reflex arc is the path of stimuli *received in consequence of* an activity of the individual. Thus experience is given us as self-creating coherence.

What we may now call circular response or circular behavior we see every day as we observe and analyze human relations, social situations.¹⁰ We see it clearly in the European conferences because there it is evident that there is no static European situation; moreover, it is evident that we can never understand the European situation by watching stimulus and response as mere stimulus and response. We have another example in labor conflict which would be much simplified if employer's purpose and workmen's purpose would remain stationary while the situation developed, but they never do. We see the same thing in our own lives:

10 I believe physiologists have not decided yet how far the sensory side of circular response is necessary to its continued functioning even although necessary to its formation, and if I were trying to establish any exact parallel between the physiological circular reflex and circular response as seen by the students of social research, such questions would be important for us, but I hope it is understood that no such exact parallel is intended.

as we perform a certain action our thought towards it changes and that changes our activity. Or we do something which requires courage and we become more courageous and do a braver thing. The relation between leaders and group is an excellent example of the reflex circle. All amicable discussion is another. The state and individual another.¹¹ Or "the man and the hour." But we need not go further afield for the working of this law than the meeting of two individuals. You say, "When I talk with Mr. X he always stimulates me." Now it may not be true that Mr. X stimulates everyone; it may be that something in you has called forth something in him. That is why I said above that we must give up the expression "act on," object acts on subject, etc. Do we not see here, to quote Bok, "the path of the stimulations which are caused, actualized, or altered by the future reflex-action?"

Through circular response we are creating each other all the time. This seems too obvious to mention, and yet where is it taken account of sufficiently? Le Bon, one of the most penetrating of sociologists, tells us much of crowds, much of individuals, but does not reveal the process of a creative meeting of individuals.

To sum up this point: the most fundamental thought about all this is that reaction is always reaction to a relating. Bok finds it in the neuro-muscular system. Integrative psychology shows us organism reacting to environment plus organism. In human relations, as I have said, this is obvious: I never react to you but to you-plus-me; or to be more accurate, it is I-plus-you reacting to you-plus-me. "I" can never influence "you" because you have already influenced me; that is,

11 See Chap. XI.

in the very process of meeting, by the very process of meeting, we both become something different. It begins even before we meet, in the anticipation of meeting. We see this clearly in conferences. Does anyone wish to find the point where the change begins? He never will. Every movement we make is made up of a thousand reflex arcs and the organization of those arcs began before our birth. On physiological, psychological and social levels the law holds good: response is always to a relating. Accurately speaking the matter cannot be expressed even by the phrase used above, I-plus-you meeting you-plus-me. It is I plus the-interweaving-between-you and me meeting you plus the-interweaving-between-you-and-me, etc., etc. If we were doing it mathematically we should work it out to the n th power.¹²

This pregnant truth—that response is always to a relation, the relation between the response and that to which the response is being made—needs further consideration, for it is the basic truth for all the social sciences. Let us consider the implications of this statement, even although this will necessitate some repetition. First, my changing activity is a response to an activity which is also changing; and the changes in my activity are in part caused by the changes in the activity of that to which I am in relation and vice versa. My response is not to a crystallized product of the past, static for the moment of meeting; *while* I am behaving, the environment is changing because of my behaving, and my behavior is a response to the new situation

12 I mean by this that if we could formulate the process mathematically, we should obtain a differential equation or a set of differential equations to be solved by integration.

which I, in part, have created. Thus we see involved the third point, namely, that the responding is not merely to another activity but to the relating between the self-activity and the other activity. The psychologists who are using the language of calculus have opened up whole reaches of thought for us, for the principles of relation as given by differential calculus help us to a clear understanding of this fundamental principle of life. Let us take an illustration—we can take one from our simplest, everyday experience and see what help mathematical thought gives us. Think of the boy going to school. He is not responding to school merely, but also to his own response to school. That is, the going to school may so stimulate him that he works much better than at home with his mother; his activity is a function of the activity that is set up between him and school. And the school too is affected by the activity- between; through either his or his parents' demand upon it, it may improve its methods. And so the interweaving goes on: the more the school alters the boy, the more chance is there of the boy altering the school. This is a situation which suggests the calculus, for if the child's going to school so stimulates him that he works harder, his performance is continuously changed by that very performance. Hence the functional relation between the two cannot be expressed in terms merely of the boy and the school, there must always be included the activity-between.

Thus the relating involves an increment that can be measured only by compound interest. In compound interest part of the activity of the growing is the adding of the growing. This is the same with all organic growth. Simple response, if there were such a

thing, would be like simple interest—if there were such a thing. There is no such thing as simple interest in the organic world; the law of organic growth is the law of compound interest. Organic growth is by geometrical progression. This is the law of social relations. France and Germany have surely not been “influencing” each other by simple, but by compound interest. We have always the increment of the increment.

Before considering social phenomena from this point of view, let us note two points that we shall have to keep in mind: first, the objective situation as constituent part of the behavior process; secondly, that internal conditioning is of equal importance with external conditioning. Both these points are very important for social research. Often, for instance, we see the head of an industrial plant trying to solve a situation by studying his men rather than by considering men and situation, and the reciprocal effect of one on the other. In regard to the second point, as the psychologist notes the neuro-muscular interplay, using every possible instrumentation to make it apparent, as he takes into consideration the factors contained in the mechanisms which are maintaining the functions he is studying, which are modifying these functions, so the sociologist must note as carefully, must see as integral part of the causal process, internal as well as external conditioning. Of course we shall remember that what is internal in the mechanism has also come from integration. When the organism experiences certain lacks, there arises a disturbed nervous system which causes the animal to make movements to supply these lacks from its environment. These

responses to external environment caused by general motor restlessness integrate with the internal stimuli and the general motor restlessness becomes specific conduct. Thus "behavior" emerges, always from the activity-plus. In one of his lectures Holt put it this way, "If driven by metabolism, we have a disturbed nervous system, that system will so act toward environment as to put environment in that state which will make it send to the nervous system what it needs."¹⁸ In this sentence the efficacy of the interrelating becomes still more apparent. Much of our older psychology failed to note sufficiently the interlacing of external stimulus and the conditions of neural, muscular and glandular response. Only recently I was surprised to see the question asked by a psychologist: "Is behavior internally or externally conditioned?" The factors of intra and extra-organic stimulation are not only equally important but are bound up together. They must be considered simultaneously. We have now a wholly dynamic psychology. The neuro-muscular mechanisms of the behaviorists tend in the hands of some writers (only in some) to become as static as the old "mental states." Behavior "pattern" is a figure of speech and not altogether a good one. We shall have, if we are not careful, as much trouble with the "patterns" of the behaviorists as the behaviorists have felt they had with the "minds" of the older psychologists.

13 See also Kempf. "Whenever the autonomic . . . apparatus is disturbed it compels the projicient sensori-motor apparatus to so adjust the receptors in the environment as to acquire stimuli having the capacity to produce adequate postural readjustments in the autonomic apparatus." Edward J. Kempf, *The Autonomic Functions and the Personality*, p. 1.

The matter of internal and external conditioning has an exact parallel in the social sciences. No one can understand the labor movement, the farmer movement, international situations, unless he is watching the integrating of internal stimuli, the lacks felt, with the responses to environment caused by these lacks. Moreover, the so-called stored-stimuli are exactly as important for sociologist as for psychologist; the sociologist has to consider in each case how far the person or persons are acting from present stimuli and how far from action patterns already existing. Let us take an illustration which involves all the points so far given:

The	1. Employer: wages, share in profits or management,
workman	conditions of factory, etc.
responds	2. General conditions: cost of living, etc.
to	3. His own desires, aspirations, standards of living, etc.
	4. The relation between his responding and the above.

The important things to notice here are: first, that the workman is responding to something in himself as well as to something outside; for instance, we have now to add to the factors which made the internal conditioning of the workmen of 1914, the restlessness caused in many by the varied life and experiences (including even foreign travel) afforded by the war, the change in his desires caused by the lavish expenditure of war profits which he sees about him, etc., etc. Secondly, he is responding to the relating between his responding and the environment. Finally, all the factors involved are varying factors and must be studied in their varying relations. By the use of the language of calculus in the definition of behavior which we are considering, we are brought at once to the heart of

every situation: the relating of things that are varying, which makes the relating vary. The Checker Taxi Company announced this week a cut in rates because of an increased volume of business; it thus makes volume of business the independent variable. Mr. Ford, on the other hand, when he reduced the price of his cars *in order to* increase volume of business, made the rate the independent variable. But both did the same thing: they measured a varying thing in relation to a varying thing, taking into account that these were affecting each other simultaneously.

We must therefore in the social sciences develop methods for watching varying activities in their relatings to other varying activities. We cannot watch the strikers and *then* the mill-owners. We cannot watch France and *then* Germany. We all know that the action of the mill-owners is changing daily the action of the strikers, that the action of the strikers is affecting daily that of the mill-owners; but beyond this is the more subtle point I am trying to emphasize here, that the activity between mill-owners and strikers is changing the activity of mill-owners, of strikers. We have to study not only a changing France in relation to a changing Germany, but also a changing France whose changes have been partly caused by the relation between its variations and Germany's variations. That is, France is not responding to Germany, but to the relation between France and Germany. To return to the language of our formula: the behavior of France is not a function of the behavior of Germany, but of the interweaving between France and Germany. The interweaving which is changing both factors and creating constantly new situations should be the study of the

student of the social sciences. Trade unionism is not today a response to capitalism; it is a response to the relation between itself and capitalism. It is of the utmost importance to bear this constantly in mind. The concept of responsibility takes on entirely new meaning with the introduction of the notion of circular response into the social sciences. The farmers are not responding to the middlemen or to middlemen plus economic conditions or even to middlemen plus economic conditions plus their own desires, but to the relation between themselves and the whole total environment, or rather the relating becomes another element of total environment.

Much light is now thrown on the subject of Chapter I, the relation of "facts" to the social process. We cannot study the "psychology" of the workman, the "psychology" of the employer, and then the "facts" of the situation, as so often seems to be the process of investigation. We must study the workman and the employer in their relation to the facts—and then the facts themselves become as active as any other part of the "total situation." We can never understand the total situation without taking into account the evolving situation. And when a situation changes we have not a new variation under the old fact, but a new fact.

A professor of philosophy told me that it made him dizzy to talk with me because, he says, he wishes always to compare varying things with something stationary. But this philosopher could not go to Europe most economically in his summer vacations unless someone were watching for him the relation of speed to fuel consumption and from this determining rates of change

that are themselves functions involving variables. Suppose a schoolboy should say to his instructor in calculus: "You are making my head spin; I cannot compare unless you give me something stationary to compare with." The only thing his instructor could reply would be: "You will have then to leave this universe; in this one we so often have variations in relation to other variations that we are obliged to learn to think in the terms of those conditions." That is, if in calculus we measure a changing activity by an activity which is also changing, if there is involved rate of change, and also rate of change of rate of change, this is only the same as in all life. But psychology sometimes abstracts from life. For instance, a behaviorist tells us that if a man disregards the red flag at a railroad crossing and crosses in front of the train, he will be fined or imprisoned, and the red flag will thus acquire that much more "meaning" for him. If he suffers from loss of limb or kills the occupants of his car, the red flag acquires still more "meaning" for him. True as an abstraction, true on the supposition that this is all that happens. What is forgotten in this illustration is that the railroad company is not slumbering meanwhile, and the second time the man may not meet red-flag-plus-meaning, but gates, at the railroad crossing.

Take again the classical illustration of the child and the candle. It is a capital illustration supposing the candle to be stationary, in other words, to be a nucleus for "meaning," but it is not always. The child burns its hand. The mother may say, "We must put electricity into the nursery," or, "We must have no uncovered flames in the nursery." This possibility is not ignored by those psychologists who use this illustra-

tion, for it is the same kind of thing that is indicated when they speak of the mother holding the child's hand away from the flame instead of teaching him something about it. I am not, therefore, quarrelling with the illustration, but only pointing out that the process of education would be easier for all of us if red flags and candles merely rolled themselves into bigger balls of "meaning"; we should in that case learn how to behave toward first one object and then another until our education was completed. And this is, indeed, a large part of education, particularly in infancy and youth, but it becomes a smaller and smaller part as we get older. We usually cannot apply what we learn from one experience to the next because the next will be different. Moreover, it is usually we ourselves who have made the next experience different. It is the child's burning himself, perhaps, which makes him find something different the next time he puts his hand out. And when we remember all that the child has to learn about flame—to discriminate between flame bare and flame enclosed, between flame enclosed with a conducting and a non-conducting substance, to distinguish between the lighting, heating and burning qualities of flame—we see how complex the matter becomes. But however you enlarge the equation with more brackets, etc., the conditioning equation expressing the relation of the variables remains the same. That is why I think the formula I have cited so useful for the social sciences if we understand and accept what is implicit in it, namely, that behavior is not a function of environment but a function of the relating of behavior and environment.

This seems to me the most illuminating thought that

has been given us of recent years for the study of social phenomena. Holt's formula does not give it to us explicitly, but his treatment of circular response does, his emphasis on the significance of the *organization* of reflex arcs and of the functional reference of behavior, the something "new" of his "critical" moments of evolution, his insistence on the fact that behavior is not a function of immediate stimulus, and his use of the functional theory of causation. The last two points will be taken up in the next chapter. We now see behavior not as a function of environment, but as a function of the relation between self and environment. The activity is a function of itself interweaving with the activity of which it is a function. In the illustration given above of the cut in rates by the Checker Taxi Company, the rate was not really a function of volume of business, but, since the rate increased the volume of business, the rate was a function of the relation, the interlacing relation, between rates and volume of business. We must be sure that our formula will fit an evolving situation.

It will perhaps be thought that I am rather forcing the use of mathematical language in this chapter, but I am using this language deliberately for several reasons. First, in order to unfold the implications in the words function and variables used in the definition of behavior which I have been employing; secondly, because I find the language of calculus so stimulating to my own thought on this subject that I hope others will too; in the third place, because the word function is used so widely, and often carelessly, nowadays, that I think we had better look into its origin and make sure that we use it accurately.

We have now, to repeat in summary, three fundamental principles to guide us in our study of social situations: (1) that my response is not to a rigid, static environment, but to a changing environment; (2) to an environment which is changing because of the activity between it and me; (3) that function may be continuously modified by itself, that is, the activity of the boy going to school may change the activity of the boy going to school. Or it might be put thus: that response is always to a relating, that things which are varying must be compared with things that are varying, that the law of geometrical progression is the law of organic growth, that functional relating has always a plus value. The social sciences must learn to deal with that plus, to reckon literally with it. A dynamic psychology gives us instead of equivalents, plusvalents. It is those which we must look for in every situation. These are the "novelties" in the psychologist's "critical" moments of evolution. It is impossible to overemphasize this point; it means a new approach to the social sciences. In the farmer-middleman controversy, find the plusvalent. In the France-Germany situation, find the plusvalent. Let every statesman and diplomat, every legislator and judge find the plusvalent; it is the only approach possible to politics or industry or international relations or our own smallest everyday problems. *Progressive* experience on every level means the creating of plusvalents.

In the physical sciences, we have some interesting, although not wholly exact, parallels of the plus value of the relating. In chemistry we find a chemical substance X decomposing into another Y at a rate proportional to the amount of X undecomposed; at the same

time by a reverse reaction Y is decomposing into X at a rate proportional to the amount of Y present. X is continuously influencing Y at the same time that Y is continuously influencing X.

In engineering we have what is called "regeneration." A radio receiving set takes in only a small amount of energy from the electromagnetic waves that reach it, but this is made to control the output of a source of considerable energy located in the set. In some sets a part of the latter energy is carried back to the former, so that the former is now intensified and effects an increased output; and the process repeats itself, building up the power of the set perhaps a thousandfold. This "regenerative" action occurs in many physical and chemical processes and is used by engineers in devising mechanical apparatus, electrical and other.

A dynamic physics studies activity rather than mass; it defines things in terms of activity, not in terms of mass. Present-day physics tells us that the rate of change of the activity may not be proportional to the mass of what is active but to the activity of the mass. We had not a dynamic physics until this was seen. It used to be said that in organic growth the increment of the organism in a given time is proportional to the magnitude of the organism itself. Now, looking at the "organism" as an activity, we should have to use some word which would include magnitude and intensity of the activity.

To conclude this chapter: the most significant thing in recent thinking is, I think, the correspondence of thought in different fields and on different levels. Philosophy has long taught us the unity of experience. You can tear it to pieces if you will and find subject

and object, stimulus and response, or—you can refuse to; you can claim the right to see it as a rational interplay of forces, as the functioning of a self-creating coherence. Consciousness is the living interplay of a self-generating activity. Or, Consciousness is the living interplay of myriads of self-generating activities which all generate themselves as a moment of the interplay. The most fundamental idea of philosophy is, I think, the recognition that there is no *Denkform* in which as mould all thought is cast, but rather a constant mode of self-generating as thought, a perpetual law of unifying to which the free activity submits itself, law and freedom each the entelechy of the other. Study of social situations reveals the working of this principle. In psychology and physiology, also, we find certain conclusions write lead us to think that experience on every level may be found to be an interrelating in which the activity of the relating alters the terms of the relating and also the relating itself. Politics, industry and law need the impetus of this thought. Our older social philosophy gave us the pernicious theories of the balance of power between nations, of adjustment between capital and labor. It gave us always equivalents; our more recent thinking shows us how to create plusvalents. This will be developed further in the chapter on Experience as Creating.¹⁴

14 It has been pointed out to me that the term plus-value does not express my idea since the very thing I am opposed to is the plus-relation, the one-by-one connection rather than the integration. But I am certainly opposed to the word super, which has been suggested in its place, for the “something new” of integration is not “over” or “more than” or “greater- than” the parts, as often erroneously claimed for “wholes.” I think plus-value *is* what I mean, for I am not referring to a plus-plus relation of the parts, but expressing the fact that integration gives an additional value, one more value, but not necessarily a greater or super value. See pp. 98-102 for further consideration of this point which is perhaps the most important in the whole range of discussion on human relations.

Because the word function is being increasingly used to express relation, there are certain warnings necessary. First, we should not use the word function to excuse us from studying each situation; this I have seen done several times recently. A phrase may be a legitimate short-cut in exposition, but it is inexcusable to let it be a short-cut in investigation. Secondly, we must not confuse function as relation and function as quantity. For us function is not a quantity left over when the activity of relating is completed; function is the activity of relating, it is the operation, not what results. A function is always functioning; our interest in it is on that very account. In the third place, the independent variable is independent only within a certain equation and our equations are constantly changing. We must not confuse a variable which is constant from moment to moment in the same statement, and varies only from statement to statement, with one that varies in the same statement. This is very important to remember in social psychology. The constant of one situation may not be, probably will not be, the constant of the next situation. In studying any one situation we look on this quantity as constant while the mutual effects of varying quantities are studied; two facts or individuals, let us say two activities, adapt themselves to each other in a certain way for any given situation; change the situation and they will probably adapt themselves in a different way.

Take the economic "law of supply and demand." According to that law price is a constant function of demand: as demand increases, price increases; as de-

mand decreases price decreases. But this law is true only on a certain assumption: that supply is fixed, that there is a certain amount of the commodity in existence which stays fixed. This is an assumption which speculators are always trying to make true, but in ordinary, legitimate, economic operations it is seldom a possible assumption *except for one situation*. Probably demand is increasing the volume of business which, in most cases—in the case of manufactured articles the materials for which can be got in practically unlimited quantities—lowers the cost of production. As a matter of fact, therefore, increased demand means, other things being equal, eventually decreased prices. Thus the function assumed for one situation cannot be carried over into another. Price is a developing situation; it depends on an interweaving; it is a function not of an independent variable alone but of the relation between it and the independent variable. Thus to say that demand raises price is wrong except in regard to a given situation. To put this into mathematical language (which seems to respond more readily than any other to our present thinking on this subject), the error would be to take a variable constant for an absolute constant. Given the amount of commodities at any minute and taking demand as an independent variable, the price will be the function of that, but from situation to situation the supply changes. The economist makes no mistake here; I am giving this as an illustration of the *kind* of error in thinking sometimes made by those who use the word function nowadays rather carelessly. In the use of the word function, the thing to be kept constantly in mind is the developing situation.