Chapter 4

The loop

Psychologists have talked a lot about the "black box," that being a metaphor for any internal part of an organism that you cannot see into or that seems forbiddingly complex to look into. Or that stops living whenever you cut it open to see what makes it live. Some psychologists, perhaps chiefly the sensory and the physiological psychologists, have wanted to look into the tiny parts of the human body that might carry the internal events that ultimately cause a muscle to contract and act upon the outside world. Other psychologists have disdainfully called that strategy "reductionism" and have claimed that action cannot be understood by looking at its tiny components. They say that we can understand action only by observing whole actions, and we should not only leave the black box unopened, but we should not even speculate about what goes on in there.

Indeed, early in the twentieth century, the famous psychologist John B. Watson (1878–1958) exhorted his colleagues to pay no attention to any concepts that implied internal processes—concepts such as sensation, desire, purpose, and so on. Watson called himself a Behaviorist—and wrote the word with a capital B. In 1929, Watson and a famous British psychologist of the time, William McDougall, published a little book containing the text of a debate between them. The title of the book was *The Battle of Behaviorism: An Exposition and an Exposure*. In it, Watson said:

> In 1912 the Behaviorists reached the conclusion that they could no longer be content to work with the *intangibles*. . . . The Behaviorist began his own formulation of the problem of psychology by sweeping aside all medieval conceptions. He dropped from his scientific vocabulary all subjective terms such as sensation, perception, image, desire, purpose, and even thinking and emotion as they were originally defined (pp. 16–17).

> Now what can we observe? Well, we can observe *behavior—what the organism does or says*. . . . we can keep [the animal] without food, we can put it in a place where the temperature is low . . . or high, where food is scarce, where sex stimulation is absent, and the like, and we *can* observe its behavior in these situations. . . . We soon get to the point where we can say it is doing so and so because of so and so. The rule . . . which the Behaviorist puts in front of him always is: "Can I describe this bit of behavior I see in terms of stimulus and response"? (pp. 18–19).

Watson had very great influence on American academic psychology. I do not think he had great influence on popular thought; what he took as scientific justification for a "theory" was a supposition already widely cherished by people everywhere. Throughout history, most people seem to have believed that a great deal of human action does result from what happens *to* the person. Most people still seem to believe that you can cause a person to do a certain thing by hitting her or by threatening to hit her. Or hit him first to show that you mean business, and then threaten him with a worse blow—a favorite method of people throughout history who have had soldiers at their command. As another example, many people will explain why someone does what he does at the age of 30 by the fact that in his childhood, his father was frequently out of town.

Did Watson try to influence non-psychologists? He certainly did. He wrote direct advice for teachers and parents. I am sure that teachers, parents, and others picked up a good deal of his vocabulary. I do not, however, think he had much convincing to do. I think most people who seized upon his vocabulary were happy to have a scientific endorsement for their already existing beliefs. Be that as it may, the history of academic psychology since Watson makes it seem

reasonable to say that he had immense influence on the work of academic psychologists. With them, too, it is possible that he had picked up a flag that most of them were eager to follow anyway.

In the same book, McDougall had his turn:

> I place my hand upon the table, and Dr. Watson sticks a pin into the tip of one finger. My hand is promptly withdrawn; that is a behavioristic fact. I say that I felt a sharp pain when the pin was stuck in; Dr. Watson is not interested in my report of that fact. His principles will not allow him to take account of the fact, nor to inquire whether my statement is true or false. He repeats this experiment on a thousand hands, hands of babies, men and monkeys; and, finding that in every case the hand is promptly withdrawn, he makes the empirical generalization that sticking a pin into an extended hand causes it to be promptly withdrawn—and that is as far as his methods and principles will allow him to go in the study of this interesting phenomenon. He maintains with some plausibility that my introspectively observed fact of painful feeling is quite irrelevant and useless to him as a student of the human organism. But now I ask Dr. Watson to repeat the experiment on myself. He sticks in the pin once more; and this time the hand is not withdrawn, but remains at rest; and I continue to smile calmly upon him. What will Dr. Watson do with this new fact, a fact so upsetting to his empirical generalization which appeared to be on the point of becoming a "law of nature"? He can do nothing with it (pp. 55–56).
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> The narrower formulation runs: . . . Every human activity and process . . . is strictly determined by antecedent processes and therefore, in principle, can be predicted with complete accuracy. . . In the sphere of human nature and conduct, this mechanistic assumption has never shown itself to have any value or usefulness as a working hypothesis. Rather, it has in very many cases blinded those who have held it dogmatically to a multitude of facts, and has led to various extravagant and absurd views of human nature, of which views Watsonian Behaviorism is one (pp. 66–67).
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> The most fundamental fact about human life is that from moment to moment each one of us is constantly engaged in striving to bring about, to realize, to make actual, that which he conceives as possible and desires to achieve, whether it is only the securing of his next meal, the control of his temper, or the realization of a great ideal. Man is fundamentally a purposive, striving creature. He . . . longs for what is not (p. 72).

You can see that I would have sided with McDougall. (That is easy for me to say from my present PCT viewpoint. But how can I know with whom I would have sided had I been listening to the debate in 1924?) Most American academic psychologists of the time sided with Watson. McDougall tells us so in a postscript he wrote in 1927, three years after the first two parts of the book were presented in debate. During those three years, McDougall saw Watson's views welcomed by more and more psychologists. He was not happy about it:

> . . . in America Behaviorism pursues its devastating course, and Dr. Watson continues, as a prophet of much honor in his own country, to issue his pronouncements. . . . Dr. Watson, consistently pursuing his wise policy of abstaining from all attempt to reply to criticisms, has issued a new book [*Behaviorism*], a restatement of his views as bald as the palm of my hand, and more bare of any indications of regard for reason and good sense. . . . the book goes far to justify Dr. Watson's contention that his thinking processes are nothing more than the mechanical interplay of his speech-organs (p. 87).
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> Meanwhile in America the tide of Behaviorism seems to flow increasingly. The press acclaims Dr. Watson's recent volume in the most flattering terms. One leading daily says: "Perhaps this is the most important book ever written. . ." (p. 94).

The trouble with Watson's strategy (and the continuing trouble with most research into human functioning today) is that the functions that shape what humans can do are the functions that go on inside the skin and especially in the circuitry of the nervous system. Would you be satisfied with a physician who refused to take a blood sample or an X-ray and who had never read a book on anatomy? Would you go to a radio repairman who refused to look inside the cabinet or to an automobile mechanic who refused to raise the hood?

Some people say, in talking about the functioning of a system, that the whole is not equal to the mere sum of the parts. I agree with that; everyone should. I like the example that Roger G. Barker used (recounted in P. Schoggen, 1989). Imagine, he

said, a video camera focused on just one player in a game of baseball, let us say on one of the basemen. The baseman stands there a while, maybe dusts off his hands, then fastens his attention firmly on something off-screen, and suddenly puts his foot on the base and catches a ball that zips into the picture. Without pausing, he throws the ball out of the picture. Another player runs into and out of the picture. The baseman stands around some more. Imagine making a video, a separate video, of the playing of every player on the diamond, but without ever showing two or more players at the same time. Now imagine that you know nothing about baseball, and you want to understand how that game is played. And imagine that someone shows you those videos of the players in a game. You would never get a glimmering of the game until you saw what was going on with other players at the same time as *this* player. I think that is a very good way to illustrate how the purposes of the individual players are achieved in the patterns of interaction of everyone and how the game is more than an arbitrary assembly of "parts."

Certainly we can say that understanding the functions of the separate components is not sufficient to understand the whole. But the converse is true, too. Knowing the external pattern is not sufficient to understand the required internal functions. Here we need a different example, one with a black box. Think again of the example of the TV set. Suppose you obey Watson's exhortation and experiment with the TV only from the outside. You fiddle with a switch or two and a picture appears on the screen. You fiddle with a knob or two and the picture changes. Aha! you think, I am causing things to happen. All I have to do is make a careful list and I'll know what stimulus causes this "animal" to give any certain response. But whoops!—sometimes this very same knob shows us galloping horses, and sometimes pirouetting dancers. Sometimes the printed names of people come on after half an hour, sometimes after an hour or even two hours, no matter how many knobs you turn. You pull out the wires from the wall and everything stops. Does the picture come in through that wire, or is the picture already inside the box, with the wire serving only to stimulate the picture into visibility? You could turn knobs and throw switches for the rest of your life, and you would never learn about the functions of tuners, amplifiers, antennas, and so on. You would learn a little about what is twistable and about a few effects you could produce, at least sometimes. You would learn, for example, how to kill the device. But you would learn nothing about the functions necessary and sufficient *to build an apparatus that can behave that way*.

I'll say once more that what you can learn from outside a device or a living creature can be very useful. From outside a TV set, you can learn how to get some interesting pictures. You can learn how to make the sound loud and soft. After you have learned those things, you can have a good time watching the thing. To learn that much, you don't have to know a thing about what goes on inside. You don't even have to know that the shapes and colors of the pictures come into the set via electromagnetic waves from elsewhere. But if you want to *make* something that acts like that thing, then you have to know how to produce the functions that can change those electromagnetic waves into a picture that your eye can translate for you. Or in the case of living creatures, if you want to make a model that can test your understanding of the functions necessary inside a living nervous system, you must be able to build parts which, when connected in the right order into a functioning whole, will do some things characteristic of living things. A model specifies the functions the researcher believes must be components of the living nervous system, and it specifies the order of connections among the components. Running the model tests whether those components connected in that way can actually "behave."

Notice, please: I am *not* saying that if you want to find the invariant processes that function in any kind of action by the living creature, you must, after explaining outward actions by functions within the nervous system, explain functions there by functions in the neurons, and then explain those functions by chemical changes, and those by interchanges of electrons, and so on without end. Let's go back to the TV set for an analogy. For the purpose of the analogy, let's assume that the set is in good working order (as we assume about a living "subject," too) and let's assume that the power from the wall outlet won't fail (just as we assume that a "subject" is adequately nourished during a study). And to make the analogy still simpler, let's assume that no program guide exists. Playing with the set, one of the invariant effects we soon discover is that a little light goes on when you push the on-off switch (and usually you get a picture, too, though not always). Another invariant is that the picture changes when you push the channel-change buttons. But you