THEORIES AND SYSTEMS OF PSYCHOLOGY

SECOND EDITION

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contemporary psychology. The earlier theorists, such as the structuralists (parallelism) and functionalists (interactionism), made their attitudes on the relationships fairly explicit. In more contemporary theories, the relationships must be inferred. However, when we come to these later theorists, we shall attempt to show how they have handled the problem.

There was another possible solution, often called *monism*, that made no attempt to separate mind and body, but considered them as one entity. A common expression of monism was simply to dismiss the mind as nonexistent and deal only with the body and its behavioral functions. This was the attitude of both the early and later behaviorists (see chaps. 12 and 13). We shall consider this matter in some detail at the appropriate time. Just as accepting the mind poses problems, so dismissing it altogether invites other problems.

EMPIRICISM

Empirical means that one's facts are gathered from observation rather than from some other method, such as intuition or conjecture. The empirical attitude is basic to all science, for regardless of how much theorizing one might do, one has to depend in part on the events one observes in the world of nature. Many, but not all, psychologists today assume an empirical attitude. We gather our data from what we observe, whether it be in an informal way of watching something happen and then recording it, or through more formal experimentation under controlled laboratory conditions.

Empiricism began as a movement in Great Britain, and stressed the all-important idea of gaining knowledge from sensory experience. For the empiricists all knowledge came from experience, but this experience did not necessarily originate in the world of reality. What united the empiricists was their dependence on experience, rather than other things such as inherited ideas, as the source of knowledge.

As we have suggested earlier in this chapter, the empiricist movement had a profound effect on the development of later science, and especially psychology.

John Locke (1632–1704)

Although Locke lived in the seventeenth century, his writings expressed more the spirit of the eighteenth century. The first of the British empiricists, Locke bridged the gap between the continental rational philosophers, such as Descartes, Leibnitz, and Spinoza, and a new attitude toward the nature of knowledge and the empirical tradition. Locke's influence on modern psychology cannot be overestimated.

John Locke was born in a small village in Somersetshire, England. Educated at Oxford, he dabbled in medicine, but never received a degree.

He spent part of his life in politics and in minor governmental offices. When Locke was fifty-eight he wrote his main work *An Essay Concerning Human Understanding*.[8] This was revised several times, and the fourth edition appeared in 1670.

Theory of Knowledge. Locke had read Descartes, and in the first book of his *Essay* he attacked Descartes' theory that some ideas we have are inborn. His arguments were as follows: If ideas were innate, they should be constant in all minds, but neither the new-born nor the illiterate shared them. If innate, ideas should not show development, but they did. Finally, since ideas came from experience, they could not be inborn.

In his analysis, Locke wrote that all ideas came from experience. At birth the mind could be considered analogous to a blank sheet of paper, a *tabula rasa*. Basically, the mind was passive, and could do only two things. First, it could receive experiences from the outside world: this involved the act of sensing. Locke was actively concerned with the whole process of sensation, since it was the primary source of all knowledge. Second, the mind could *reflect upon itself*. It was basically through this process of reflection, or what we today might call introspection, that it became possible for man to engage in the process we call thinking. In stating that all knowledge came from experience, Locke was reiterating what Aristotle had said many centuries before.

When experiences came to us, they might be of two types, simple or complex. The first were very pure, and came only from sensation, like seeing the color red. Those of the more complex kind were made up of a combination of simple experiences or ideas.

Ideas as experiences might also have qualities. These qualities were *primary* and *secondary*. The primary qualities were inseparable from the object. Such qualities as movement, extension, shape, solidity, or number were of this sort. The secondary qualities, such as color, taste, and touch arose in the senses and were known apart from the object. It was through reflection that man got knowledge of himself, was able to think, made comparisons, and remembered.

The simple ideas seemed quite reliable because they seemed to correspond well with the real object. About complex ideas we were not so sure. We could get a rough approximation, but we might never know their real essence. For example, we would never be able to get at the nature of truth, which obviously was a complex idea.

Locke had no doubt about the existence of a real physical world, although he really could not experience its substance. However, he argued that you could not experience the qualities of things without there being something behind them. We knew there was something which gave us these

[8] John Locke, *An Essay Concerning Human Understanding*, A. C. Fraser, ed. (New York: Dover Press, 1959).

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qualities, but that something was "I know not what." We could experience ourselves as minds, but all we knew of our minds was that they existed.

Association. In the fourth edition of the *Essay*, Locke introduced the notion of the association of ideas. He exemplified the significance of association in his illustration of the "man born blind and suddenly made to see." Such a man could not identify a cube by sight if he had only experienced it through the sense of touch. Thus, the two had to be associated together. Once we experienced some ideas, through association with other ideas, the original idea might be brought back to mind when presented with the second.

Locke's Dualism. For Locke, there was no doubt that minds existed, but your mind with different experiences might be quite different from mine. At this point, it should be noted that by the time Locke came along, from a historical point of view, the theological conception of mind as soul had been somewhat extracted, leaving the mind apart from the body, but without spirit. Locke believed in God; not that he knew Him through his senses, but through reflection. So, there *was* a real world (something he knew not what), and there also existed individual minds which received the experiences from the real world. Basically, Locke was not concerned with physiological or body correlates of mind and body as was Descartes. He merely presumed that both mind and body existed as separate entities; how one could get from one to the other did not seem to be an important issue.

Locke's Significance. Locke was concerned with what he could learn from his senses. He believed in a world of nature as the ultimate source of knowledge. This was a basic presupposition of all science, namely, that we were dealing with natural events. Locke believed in mind as separate from body, but this was part of a tradition which he never bothered to doubt. There were no inborn ideas, and the fact that God existed was accepted, but He was not the source of knowledge. The fact of a basic reality as the source of all knowledge was the significant point. Finally, Locke's introduction of the principle of association served as a basic principle of connection, which was held by many theories of psychology up to the present time.

George Berkeley (1685–1753)

The second of the British empiricists was an Irishman who was educated at Trinity College, Dublin. A deeply religious man, Berkeley was ordained in the Anglican Church at the age of 24. His two principal psychological works are *An Essay Towards a New Theory of Vision*,[9] written in 1709, and

[9] George Berkeley, *An Essay Towards a New Theory of Vision*, in A. A. Luce and T. E. Jessop, eds. *The Works of George Berkeley*, Vol. 1 (London: Nelson, 1948).

A Treatise Concerning the Principles of Human Knowledge,[10] written a year later. Both were written when he was a relatively young man. In 1722 he attempted to found a college in Bermuda, but failed. For nearly three years he settled in the United States at Newport, Rhode Island. While there, he met Jonathan Edwards, the American theologian from Massachusetts who promoted a strict form of Calvinism in the area. For the last eighteen years of his life he became Bishop of Cloyne, County Cork, Ireland. As a result of the eventual "westward-ho" movement in the United States, a town in California was named after him. This presumably resulted from a poem he wrote on the theme, "Westward the course of an empire takes its way."

In his *Essay Towards a New Theory of Vision*, Berkeley introduced the question of how it was possible for us to perceive visually in three dimensions when, in actuality, our eyes experienced only two dimensions. The previous explanations which he referred to as the "angle argument" considered the angles of light which came from the object seen. However, since we could not actually *see* the angles, how was this any explanation at all for perceiving distance or the third dimension? He suggested that we judged the depth or distance of objects by *associating* the character of that distance. The size and shape of objects were associated by sight and by touch. Here, he included movement in space, for example, how far we could reach or could walk to the object. This became associated with its size. In Berkeley's writings we had an extension of the association previously introduced by Locke. However, Berkeley's association was more specific because it tied the two together by contiguity in space and time.

In his *Treatise Concerning the Principles of Human Knowledge*, Berkeley assumed a good deal of what Locke had already said. However, he took a new approach to the problem of how we got knowledge. Locke had said there was a real object and a sensation received in the mind from that object. As to the primary qualities of the object, Locke had said they existed in the object, but he could never really know the nature of that object. For Berkeley, all he knew was what he perceived, in other words his experiences. "Esse est percepi." Being is perceiving. There were no primary qualities, only secondary ones.

Reality was not the real world of nature, but consisted of a great many human minds. All we really knew of the real physical world was the impressions we had. In other words, we knew only our experiences. He presumed that we perceived nothing but our own experiences. By the existence of a thing, all we could say was that it was perceived. So we had individual minds and the experiences they perceived, nothing more. If this were so, where did we get our experiences from, if not the real world of objects? Ultimately, the ideas came from God. This belief that all of reality was merely minds and

[10] George Berkeley, *A Treatise Concerning the Principles of Human Knowledge*, in A. A. Luce and T. E. Jessop, eds., *The Works of George Berkeley*, Vol. II (London: Nelson, 1949).

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their experiences came to be known as *subjective idealism.* We had minds and their experiences and God and his experiences. Here, our dualism had shifted to a higher level—minds and their experiences and God and his experiences. If we all experienced the same room, God had given us all the same ideas.

For Locke, mind was a substance which received ideas from the real world. For Berkeley, anything outside the experiences in our minds must be within the mind of God.

Significance of Berkeley. Berkeley was an empiricist in the sense that he said we know nothing more than our experiences. The problem was to find out where the experiences came from. Since he could not know the objects or the real world, they had to come from somewhere, and God seemed to be the answer. Berkeley's attention to association was a real step forward in explaining the perception of depth and distance or the third dimension by means of association.

David Hume (1711–1776)

The third British empiricist was a Scotsman who was born in Edinburgh. He was, for the most part, self-educated. He never achieved a university professorship mainly because of his rather unorthodox religious convictions, which we shall soon discuss.

One of his earliest works, *A Treatise on Human Nature*[11] is probably of greatest concern to us. As with Berkeley, it is difficult to say that Hume really had a psychology as such, but his writings have some marked implications.

Locke had accepted objects, experiences, and the minds that received them. Berkeley had accepted God, minds, and experiences. For Hume, there were only experiences. A quotation from Hume's *Treatise* will make the point clear.[12]

> Mind is nothing but a heap or collection of different perceptions, unified together by certain relations and suppos'd tho' falsely to be endowed with a perfect simplicity and identity.

All we knew was that we had impressions (sensations) and ideas. We believed there was a real object only because our impressions tended to fit together. You could not prove a table existed in your salon after you had left the room.

Mind did not exist apart from impressions. We had no way of knowing that anything existed apart from experiences. All Hume found was a flowing stream of impressions and ideas.

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[11] David Hume, *A Treatise on Human Nature,* E. A. Selby-Briggs, ed. (Oxford: Clarendon Press, 1896).
[12] *Ibid.,* book 1, part 4, sec. 2.

Like his predecessors, Hume was concerned with association. Locke and Berkeley had suggested two laws of association, contiguity (togetherness) and similarity. Hume suggested three: resemblance (similarity), contiguity (togetherness in space and time), and cause and effect. To use his own examples, a picture led our thoughts to the original thing (similarity); on the mention of an apartment, one might mention other apartments (contiguity); and we associated a wound with the pain that follows it (causality).

But what about causality? Was there any necessary connection between any two events? One might have observed the sun to rise and set any number of times, but, said Hume, we had no way of knowing or being sure that it would rise again. We only got the idea because of these associations. So, what Hume did was to reduce cause and effect ultimately to contiguity; one thing followed another.

For Hume there was no evidence from experiences that God existed. Again, all we knew was our impressions and ideas. As far as minds or separate entities existing, we got that idea because of the assumption in filling in the gaps where no impressions were known. We got the idea that we existed as a self only because a group of impressions of the body came together.

Implications of Hume. Hume has been considered the supreme skeptic by most philosophers. However, if one looks at Hume's theories from the viewpoint of psychology today, we can say he made a positive step in doing away with the mind, and consequently the dualism that existed from Locke and Berkeley. Since he had denied mind or soul, we had the first psychology without a mind as separate from the body since the time of the ancient Greeks.

On the other hand, Hume was completely subjective, as was Berkeley. In denying reality he made a revolutionary change that stressed the purely mental as opposed to the physical. In this sense, Berkeley and Hume took a step backwards.

ASSOCIATIONISM

The movement we refer to as associationism was a direct outgrowth of empiricism. Much of what the empiricists had said was taken for granted by the associationists. Locke, Berkeley, and Hume had all talked about the association of ideas. The associationists merely extended the point further. They argued about how many laws of association there should be, and, in the case of David Hartley, the first associationist that we consider, the underlying physiological explanations in the brain.

As associationism was gaining momentum, a minor revolt arose among a group of men in Scotland, which became known as the *Scottish School.* This deviation from the principles of association was an interesting sidelight in the history of psychology, and should not be ignored.

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In psychology today, we do not speak so much of the association of *ideas,* as of the association of stimuli and responses or the association of responses and rewards and punishments.

In a later chapter on modern associationism, we shall discuss some men who took the ideas of the older associationists and interpreted them in contemporary terms. For these people, association was a basic principle of learning. Such men as Pavlov, Thorndike, and Guthrie accepted it as one of the most basic principles of their psychology.

David Hartley (1705–1757)

A contemporary of Hume, Hartley has often been called the father of British associationism. Others who followed him were James Mill and his son, John Stuart Mill, Alexander Bain, and Herbert Spencer. The latter two brought association psychology up to the twentieth century. We shall follow this thread in the history of psychology, even though we shall have to backtrack chronologically to include some other contributors, mainly from Germany.

Hartley's psychology was contained in his *Observations of Man,*[13] published in 1749.

Hartley was a physician and, unlike Locke, Berkeley, and Hume, he expressed a deep concern for the mind-body relationship. He was impressed by Newton's earlier observations that all physical things were forms of motion. Beginning with Newton's studies of motion and, in particular, the law of the pendulum, Hartley carried this idea of motion into the mental world.

When light struck the eye, the motion of particles or vibrations was changed from ether waves into vibrations in the nerves and the brain. He called these smaller vibrations which occurred in the nervous system *vibratiuncles.* As long as the light continued to strike the eye, these little vibrations would continue to flow. When the light was cut off, the vibrations became weaker in strength. Memories then were the reactivation of the original vibrations.

Hartley presumed only one law of association, that of contiguity, and he proceeded to explain how this worked in the brain. When two sensations reached the brain, either together or in succession, they would set up vibrations in such a way that they became connected. Later, when one idea reactivated a vibration, the other vibration would also occur.

The parts of the brain were so connected that if a first stimulus was presented causing vibrations in a particular region, the arousal of the second brain region could occur without the need of the second stimulus. If a series or association such as *A,B,C,D,* occurred in succession, they left a trace of vibrations *a,b,c,d.* The reoccurrence of A, then would set off *b,c,* and *d* vibrations.

[13] David Hartley, *Observations on Man, His Frame, His Duty, and His Expectations,* 4th ed. (London: Johnson, 1801).

Hartley's Significance. Hartley can be considered as one of the first physiological psychologists, although Descartes had tried to give some physiological explanation (although primitive) of how the nervous system worked in order to explain his mind-body interaction. Hartley attempted to relate the mental to the physical (ideas and vibrations), and to give a physiological explanation for the mental idea or image in terms of vibratory motions in the brain. Despite his naturalistic attempts at explaining the mental (experience in mind) in physiological terms, he was still a dualist. Psychophysical parallelism was the answer. What consisted of ideas and images on the mental side, were the correlated vibrations in the brain on the physical side.

The Scottish School

For the moment we must interrupt our exposition of the British association movement to discuss another movement which arose in protest. The main protagonists were all teachers at Scottish universities who were solid Presbyterians. The important figures were *Thomas Reid* (1710–1796), *Douglas Stewart* (1753–1828), and *Thomas Brown* (1778–1820). In fact, it was Thomas Brown who attempted to bring the movement back to the stream of associationism, although he substituted the term "suggestion" for association.

Thomas Reid was the first of these men to object to the association laws of Hume. In his book *Essays on the Intellectual Powers of Man*[14] he stated that the mind *did* know more than its own processes. He proposed what today we would call a "faculty psychology," in which the mind was an organized entity with powers to perform various psychological activities. He was not the first to propose such a psychology, if we recall St. Augustine (p. 32). In any event, these faculities might include self-preservation, imitation, desire, self-esteem, pity, gratitude, duty, and imagination. There were also six intellectual powers: perception, judgment, memory, conception, moral taste, and will.

He not only objected to Hume's laws of association but also to Hume's idea that he doubted the existence of real objects. Reid said "All mankind could not be wrong and go against the wisdom of the ages." We did experience sensations. There was no doubt, he told us, that we received experiences from real objects, and that God's wisdom added the plusses to turn sensation into man's wisdom of the external world.

In Reid's psychology, we had, in a sense, a regression to medieval dogma. The faculty was a capacity of the soul. The fact that man was born with innate capacities is still a common concept today in such doctrines as the inheritance of intelligence, musical ability, or mechanical aptitude. On the other hand, he reinstituted the concept of a "real world," a fact that Hume had denied.

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[14] Thomas Reid, *Essays on the Intellectual Powers of Man*, W. Hamilton, ed. (Edinburgh: Malcachian, Stewart, 1849).

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When we come to Thomas Brown, a disciple of Stewart, we have an attempt to bring the Scottish psychology back to the association movement. In Brown's *Philosophy of the Human Mind*,[15] he still accepted the idea of a unitary soul or mind, but he needed some principle to explain how the mind functioned. Not daring to use the term "association," he substituted instead "suggestion," so as not to be thought of as reverting to the associationists and all they represented.

The primary laws of suggestion were contiguity, resemblance (similarity), and contrast. If one will recall Aristotle (pp. 26–27), these were the same laws he stated in *De Anima*. There were also secondary laws of suggestion. These could allow for variations such as duration (length of the original sensation), liveliness, frequency of presentation, recency, degrees of coexistence with other suggestions, and constitutional differences of mind or temperament.

However, we should remember that Brown did not revert completely and become another associationist. Mental life was not merely the accumulation of sensory experiences. To solve the objection of the existence of real things as proposed by Berkeley and Hume, Brown took the sensations from the object and added the muscle sense (today called kinesthetic or proprioceptive). Our belief in the existence of real objects was due to our feelings of muscular excitation. For example, we had the sensation of the rose from sight and smell. As soon as we discovered that the sensed rose required muscular effort to move it, the rose began to suggest real resistance. By such suggestion, the rose in our perception was turned into the concept of the real object. This really, then, turned out to be an extension of the concept of associationism.

Back to Associationism: The Mills

James Mill (1773–1836) and his son, *John Stuart Mill* (1806–1873) were primarily concerned with history and political theory, not psychology. They became intimately involved in a movement in nineteenth-century British philosophy called utilitarianism. They believed that by the usefulness of self, political, and legal action we could gain pleasure and avoid pain.

In his book, *An Analysis of the Phenomenon of the Human Mind*,[16] James Mill described his rather simple-minded associationism. The mind was made up of sensations and ideas. Ideas were derived from sensations. They were the primary states of consciousness. What James Mill meant by idea, we today would call image, although that term had not come into common use then. Perception was the process whereby a number of sensory bits were put

[15] Thomas Brown, *Lectures on the Philosophy of the Human Mind* (Edinburgh: Tait, 1820).
[16] James Mill, *An Analysis of the Phenomenon of the Human Mind* (London: Longmans and Dyer, 1829).

together. For Mill, like Hartley, there was only one law of association—contiguity. However, he was very careful to point out that contiguity worked in two ways—associations could occur successively and simultaneously.

The idea we had of a real object was an addition of the original components put together by association. The idea of a window was made up of the ideas of glass, wood, and whatever else made up a window. The principle became known as "mental mechanics."

His son, *John Stuart Mill*, turned out to be a more important person in the history of human thought than his father. According to his writings and biographical references,[17] he was a child prodigy who learned Greek at the age of three and read Plato in the original at eight years. He had, for the most part, been privately taught by his father.

What we learn about his psychology is found in his *Logic* and in the edited and annotated edition of his father's book, *An Analysis of the Phenomenon of the Human Mind*. He accepted sensations and ideas as the basic elements of the mind. Unlike his father who believed the mind was passive, he concluded it to be active, that is, it could do more than accept the elements reflected upon it.

On the subject of association, he agreed with his father on contiguity, but added similarity and intensity.

Instead of accepting an additive process in combining the elements of sensation, he thought that the sensory elements could fuse so that what we had was a kind of "mental chemistry" where a new entity was not equivalent to the sum of its parts. Thus, the separate elements in the new fusion could no longer be distinguished. The loss of identity of the original elements was like the formation of a new combination in chemistry. Therefore, when a sensation was rearoused, the other parts of the combination would also be recovered.

Alexander Bain (1818–1903)

Bain was a Scotsman who spent his whole life in Aberdeen. His principal works which concern us in psychology were *The Senses and the Intellect* (1855)[18] and *The Emotions and the Will* (1859).[19] These can be considered the first books on psychology as such. Prior to Bain, what we had gleaned as psychological implications had been from philosophical and theological treatises (except for Aristotle). Along with Herbert Spencer, Bain brought the whole British association movement to a conclusion. In *The Senses and the Intellect*, Bain stated that sensations and feelings could come together in close succession in such a way that when one of them was later brought to mind, the others were also likely to reoccur. This was much the same idea as stated by Hartley. For Bain, the solution to the mind-body problem was simply that

[17] R. I. Watson, *op. cit.*
[18] Alexander Bain, *The Senses and the Intellect* (London: Parker, 1855).
[19] Alexander Bain, *The Emotions and the Will* (London: Parker, 1859).

of parallelism. Of course, Bain was not the first to take such a parallelist position, as we may recall from the works of Leibnitz and Hartley several centuries earlier.

Boring[20] has suggested that Bain was the first modern physiological psychologist. Bain actually brought very little that was new to psychology, except for his attempts at more modern physiological explanations as the correlates of mental events. For example, he described the sense organs and how they worked, he wrote of the reflex arc, and recounted what was known of how the brain worked. To Aristotle's five senses, he added the "organic" which was involved in hunger, thirst, or other internal conditions. He described how the muscles worked in opposing pairs. Thus, his explanations of physiology were more sophisticated than those of either Hartley or Descartes.

Bain, then, in one sense brought associationism to a conclusion. On the purely descriptive side, there was nothing to be added. On the other hand, he stood at the new threshold of psychology which stressed association in a more experimental context, as exemplified in the works of Pavlov and Thorndike (see chap. 10), Wundt (see chap. 6), and Titchener (see chap. 7).

Herbert Spencer (1820–1903)

In 1870 Spencer wrote *Principles of Psychology*[21] in which he considered association to be the significant binding principle of psychology. What was new thus far was his theory of *evolutionary association*. He antedated Darwin, having started writing about evolution in 1850.

According to Spencer's theory, everything in the beginning of the universe was related to everything else in an expanding totality. Any kind of development, whether it referred to living or nonliving matter, involved a process of differentiation—that is, the emergence of recognizable and distinct parts. As man evolved, his nervous system became more complex and correspondingly allowed for the possibility of his being able to comprehend more complex experiences on the mental side. Along with greater differentiation, there was also an integrating principle which brought things back together. This was the principle of association, with which more and more complex types of experiences could be integrated.

Earlier in the nineteenth century, Jean-Baptiste Lamarck, the French naturalist, had proposed an evolutionary theory in which acquired characteristics could be passed on from one generation to another. Spencer applied this notion to associations, and this was probably the most novel aspect of his theory. He believed that when particular associations occurred often enough in an individual, they could be passed on to one's offspring. These associations would take on the form of instincts.

[20] E. Boring, *op. cit.*
[21] Herbert Spencer, *Principles of Psychology*, 2nd ed. (London: Williams and Norgate, 1870–1872).

Spencer had developed his evolutionary doctrine in the years prior to the publication in 1859 of Darwin's theory of evolution as presented in *The Origin of the Species*.[22] When Darwin's work appeared, Spencer jumped on the band wagon, and Darwin accepted him, calling him "our philosopher." [23]

After Spencer and Bain, British associationism came to an end. In a sense, it could go no further. It remained for succeeding experimental psychologists to take over the basic principle.

NATIVISM

To continue with the final major theme from the history of philosophy, we must backtrack to eighteenth-century Germany. In the beginning of this chapter, we spoke of nativism as a reaction to empiricism. We must now consider Immanuel Kant and his impact on modern psychology.

Immanuel Kant (1724–1804)

Anyone who is familiar with the history of philosophical thought might wonder why the name of Kant should even be mentioned in this book. Although he was one of the greatest philosophers of all time, Kant was not a psychologist. In fact, he pointed out in his *Anthropology*[24] that psychology could never be a science; yet Kant fostered a scientific attitude.

In some ways, Kant set psychology back with his insistence on subjectivism. The mind could not be reduced to a brain or to bodily processes. It was impossible to use deductive methods to demonstrate the reality of the mind. Of course, this attitude was not new, since we have already encountered it with the Church Fathers.

By insisting on the unity of perception, however, Kant was attacking the associationism of the British empiricists as hard as he could. To Kant, experience was a unitary phenomenon. The presupposition that a perception could not be broken down into its divisible parts became the heart of the Gestalt psychology of the twentieth century. Here, then, was a first influence of Kant on modern psychology.

A second influence was to be found in his theory of *nativism*. By this, he meant that our tendency to perceive space and time as such was not entirely dependent on experience, but was native or inborn. The Gestalt psychology of the early twentieth century had also accepted this notion in a

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[22] Charles Darwin, *The Origin of Species by Means of Natural Selection*, 6th ed. (New York: Appleton-Century, 1897).
[23] R. I. Watson, *op. cit.*, p. 291.
[24] Immanuel Kant, *Anthropology* in E. Cassierer, *ed. Immanuel Kant's Werke*, Vol. VIII (Berlin: B. Cassierer, 1922).

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modified form when they spoke of the "primitive organization of experience." This was interpreted to mean that we tended to perceive things in natural ways which did not depend on learning. This notion was quite distinct from that of the British empiricists. Putting it another way, nativism implied that human beings had inherent or "given" ways of knowing things which were not dependent on experience.

Other more recent implications of nativism are to be found in the studies of the animal ethologists and in studies of perception in human infants. We made reference to these in the section on basic issues in chapter I. The ethologists have placed great emphasis on inborn or "innate" ways that animals perceive their environments. In the cases of human infants, there is evidence to indicate that they might have native depth perception by the time they are able to crawl. In these instances, infants would tend to avoid crawling over "visual cliffs," even though their mothers might be attracting them from the other side.

There is one final figure in the history of philosophy who, although he does not seem to fit into any of the four basic themes or issues mentioned in this chapter, had significant influence. He is Johann Herbart. He accepted some of Kant's ideas; yet he was not a nativist. However, since, like Kant, he was German, and since he also succeeded Kant in filling the university chair at Königsberg, we shall place him in this final section.

Johann Herbart (1776–1841)

Herbart presumed to build a psychology based on experience, metaphysics, and mathematics. He believed that psychology could not be experimental but that it could be mathematical. Although Herbart agreed with Kant's notion of a unitary mind or soul, he did allow that the mind could be a composite of smaller units. He drew from Leibnitz the idea that there could be degrees of consciousness and unconsciousness. The mind could be thought of as an apperception mass, made up of psychic states which could cross the threshold of consciousness and enter the apperception mass. In the unconscious, ideas existed in a sort of static state. These psychic states or ideas had forces of various intensities. If the force were strong enough, they could overcome the counter forces already in the apperception mass and enter into consciousness. Herbart labelled this interaction of psychic forces in and out of consciousness "psychic dynamics."

We mentioned earlier that Herbart believed psychology could be mathematical. He calculated conditions which could determine what could and could not enter consciousness. First, there were the effects of opposing ideas on each other. One had to calculate the amount of one force that was going to oppose another force. Second, it was possible for two ideas to combine and suppress the ideas that were weaker.

The amount of assistance provided by one idea to another, which

would enable it to get back into consciousness, could also be calculated. Herbart believed all this could be worked out mathematically.

Implications of Herbart. Although he was committed to the doctrine of a soul, which he had borrowed from Kant, Herbart was interested in the idea of scientific psychology. His calculations were nothing more than fictions—purely hypothetical—nevertheless, he brought to psychology the idea that psychology could be quantified. He proposed that somehow his "psychic dynamics" (as mental phenomena) could be measured. The whole idea of measurement and quantification was an important basis for modern experimental psychology.

Other influences of Herbart will be understood later in the writings of Freud (see chap. 16) and Wundt (see chap. 6). It is clear by now that Freud did not invent the concept of the unconscious. However, Freud's notion of opposing forces between consciousness and unconsciousness was very important to his theory. Furthermore, it is well known from biographical sources[25] that Freud was acquainted with Herbart's writings.

It is difficult, without explaining the whole psychological systems of Freud and Wundt, to explain Herbart's influence. But, among other things, Wundt accepted the concept of the apperception mass (p. 84). When we come to an analysis of Wundt's system, we can reflect and see how he borrowed from Herbart, as well as from the British empiricists and associationists.

SUGGESTED FURTHER READINGS

Dennis, W., *Readings in the History of Psychology*. New York: Appleton-Century-Crofts, 1948, chs. 4, 8, 9, 10. Readings from Descartes', *The Passions of the Soul*, Locke's *Essay Concerning Human Understanding*, Berkeley's *New Theory of Vision*, and Hartley's *Observations on Man*.

Kantor, J. R., *The Scientific Evolution of Psychology*, Vol. II. Chicago, Illinois: The Principia Press, 1969, chs. 21–27 and 29. A consideration of Renaissance influences, the continental philosophers, the mind-body problem, the British empiricists, the Scottish School, and Kant. All very scholarly and edifying to the sophisticated reader.

Klein, D., *A History of Scientific Psychology*. New York: Basic Books, 1970. A treatment of the same men as mentioned above, also at a rather sophisticated level.

Murphy, G., *An Historical Introduction to Modern Psychology*, rev. ed. New York: Harcourt, Brace and Co., 1949, chs. 2–4. A fairly elementary discussion of the seventeenth, eighteenth, and early nineteenth century philosophers and their psychological influences. Many of the same men mentioned above are discussed.

Robinson, D. N., *An Intellectual History of Psychology*. New York: Macmillan Publishing Co., 1976. Emphasis is on philosophical influences from the

[25] E. Jones, *The Life and Works of Sigmund Freud*, Vol. I (New York: Basic Books, 1953–1957).

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ancient Greeks, through the scholastic period, to modern philosophical influences.

Watson, R. I., *The Great Psychologists from Aristotle to Freud*. Philadelphia: J. B. Lippincott, 1963, chs. 7–9. Readable discussions of the men mentioned in Kantor and Murphy, and easier reading than Kantor.

Wolman, B. B., ed., *Historical Roots of Contemporary Psychology*. New York: Harper and Row, 1968, chs. 2, 3 and 11. Contributed essays, each by a different author, on the psychological contributions of associationism, Herbart, and Kant.