

HARTLEY ON

ASSOCIATIONS OF THE MIND
AND VIBRATIONS OF THE BODY

temporary or successive. But as, notwithstanding this distinction and separability, we suppose the whole train of perceptions to be united by identity, a question naturally arises concerning this relation of identity, whether it be something that really binds our several perceptions together, or only associates their ideas in the imagination; that is, in other words, whether, in pronouncing concerning the identity of a person, we observe some real bond among his perceptions, or only feel one among the ideas we form of them. This question we might easily decide, if we would recollect what has been already proved at large, that the understanding never observes any real connection among objects, and that even the union of cause and effect, when strictly examined, resolves itself into a customary association of ideas. For from thence it evidently follows, that identity is nothing really belonging to these different perceptions, and uniting them together, but is merely a quality which we attribute to them, because of the union of their ideas in the imagination when we reflect upon them.⁵

Berkeley had found in the self or mind an entity that knows the objects of sense (p. 43). Hume denied that there was any entity to be found. Mind and self are a collection of impressions, nothing more. He thus completed the progression of thought on the nature of experience that had started with Locke's blithe assertion that experience arose from sense impression but did not question the existence of the independence of objects. Berkeley, while denying we could know the existence of objects from experience as such, but God, the "permanent perceiver," gave us the assurance of their presence through the soul, which unified our experiences. Hume denied this last step by denying that the mind was more than a collection of impressions from which all else begins.

DAVID HARTLEY (1707-1757), English philosopher-physician, developed a Newtonian inspired psychological model, by adding an underlying physiological substratum which Locke deliberately had foregone. He wanted to explain the operation of the human body as well as the mind in mechanical terms. Before him, Descartes had done so for the body, but Hartley would unite a mechanical view of body with a mechanical view of the human mind. He introduced his major work in 1749, *Observations of Man*, with the forthright statement, "Man consists of two parts, body and mind."

The beginning of the first chapter states his purpose and his sources:

My chief design in the following chapter, is, briefly, to explain, establish, and apply the doctrines of vibrations and association. The first of these doctrines is taken from the hints concerning the performance of sensation and motion, which Sir Isaac Newton has given at the end of his *Principia*, and in the questions annexed to his *Optics*; the last, from what Mr. Locke, and other ingenious persons since his time, have delivered concerning the influence of association over our opinions and affections, and its use in explaining those things in an accurate and precise way, which are commonly referred to the power of habit and custom, in a general and indeterminate one.

The doctrine of vibrations may appear at first sight to have no connection with that of association; however, if these doctrines be found in fact to contain the laws of the bodily and mental powers respectively, they must be related to each other, since the body and mind are. One may

expect, that vibrations should infer association as their effect- and association point to vibrations as its cause.¹

This excerpt is followed by an explanation of how physical vibrations and sensations are related. External physical vibrations set in motion the white medullary substance of the brain with which sensations are associated.

The evidence which he presented drew upon whatever physiological and medical information was then available, which meant that it could not be couched in terms of nerves or neural impulses. Representative is his account of the reaction between simultaneous and successive association in the mind and vibrations in the brain and is given in successive propositions:

Prop. 10. Any sensations A, B, C, etc. by being associated with one another a sufficient number of times, get such a power over the corresponding ideas a, b, c, etc. that any one of the sensations A, when impressed alone, shall be able to excite in the mind, b, c, etc. the ideas of the rest.

Sensations may be said to be associated together, when their impressions are either made precisely at the same instant of time, or in the contiguous successive instants. We may therefore distinguish association into two sorts, the synchronous, and the successive.

This proposition, or first and simplest case of association, is manifest from innumerable common observations. Thus the names, smells, tastes, and tangible qualities of natural bodies, suggest their visible appearances to the fancy, i.e. excite their visible ideas; and, vice versa, their visible appearances impressed on the eye raise up those powers of recognizing their names, smells, tastes, and tangible qualities, which may not improperly be called their ideas, as above noted; and in some case raise up ideas, which may be compared with visible ones, in respect of vividness. All which is plainly owing to the association of the several sensible qualities of bodies with their names, and with each other. It is remarkable, however, as being agreeable to the superior vividness of visible and audible ideas before taken notice of, that the suggestion of the visible appearance from the name, is the most ready of any other; and, next to this, that of the name from the visible appearance; in which last case, the reality of the audible idea, when not evident to the fancy, may be inferred from the ready pronunciation of the name. For it will be shown hereafter, that the audible idea is most commonly a previous requisite to pronunciation. Other instances of the power of association may be taken

from compound visible and audible impressions. Thus the sight of part of a large building suggests the idea of the rest instantaneously; and the sound of the words which begin a familiar sentence, brings the remaining part to our memories in order, the association of the parts being synchronous in the first case, and successive in the last.

It is to be observed, that, in successive associations, the power of raising the ideas in only exerted according to the order in which the association is made. Thus, if the impressions, A, B, C, be always made in the order of the alphabet, B impressed alone will not raise a, but c only. Agreeably to which, it is easy to repeat familiar sentences in the order in which they always occur, but impossible to do it readily in an inverted one. The reason of this is, that the compound idea, c, b, a corresponds to the compound sensation, C, B, A; and therefore requires the impression of C, B, A, in the same manner as a, b, c, does that of A, B, C. This will, however, be more evident, when we come to consider the associations of vibratory motions, in the next proposition. . . .

Prop. 11. Any vibrations, A, B, C, etc. by being associated together a sufficient number of times, get such a power over a, b, c, etc. the corresponding miniature vibrations, that any of the vibrations A, when impressed alone, shall be able to excite b, c, etc. the miniatures of the rest. . . . it seems. . . deducible from the nature of vibrations, and of an animal body. Let A and B be two vibrations, associated synchronically. Now, it is evident, that the vibration A (for I will, in this proposition, speak of A and B in the singular number, for the sake of greater clearness) will, by endeavouring to diffuse itself into those parts of the medullary substance which are affected primarily by the vibration B, in some measure modify and change, B, so as to make B a little different from what it would be, if impressed along. For the same reasons the vibration A will be a little affected, even in its primary seat, by the endeavour of B to diffuse itself all over the medullary substance. Suppose now the vibrations A and B to be impressed at the same instant, for a thousand times; it follows, from the ninth proposition, that they will first overcome the disposition to the natural vibrations N, and then leave a tendency to themselves, which will now occupy the place of the original natural tendency to vibrations. When therefore the vibration A is impressed alone, it cannot be entirely such as the object would excite of itself, but must lean, even in its primary seat, to the modifications and changes induced by B, during their thousand joint impressions; and therefore much more, in receding from this primary seat, will it lean that way; and when it comes to the seat of B, it will excite B's miniature a little modified and changed by itself.

Or thus: When A is impressed alone, some vibration must take place in the primary seat of B, both on account of the heat and pulsation of the arteries, and because A will endeavour to diffuse itself over the whole medullary substance. This cannot be that part of the natural vibrations N, which belongs to this region, because it is supposed to be over-ruled already. It cannot be that which A impressed alone would have propagated into this region, because that has always hitherto been over-ruled, and converted into B; and therefore cannot have begotten a tendency to itself. It cannot be any full vivid vibration, such as B, C, D, etc. elonging to this region, because all full vibrations require the actual impression of an object upon the corresponding external organ. And of miniature vibrations belonging to this region, such as b, c, d, etc. it is evident, that b has the preference, since A leans to it a little, even in its own primary seat, more and more, in receding from this, and almost entirely, when it comes to the primary seat of B. For the same reasons B impressed alone will excite a; and in general, if A, B, C, etc. be vibrations synchronically impressed on different regions of the medullary substance, A impressed alone will, at last, excite b, c, etc. according to the proposition.

If A and B be vibrations impressed successively, then will the latter part of A, vis, that part which, according to the their and fourth proposition, remains, after the impression of the object ceases, be modified and altered by B, at the same time that it will a little modify and alter, it, till at last it be quite overpowered by it, and end in it. It follows therefore, by a like method of reasoning, that the successive impression of A and B, inefficiently repeated, will so alter the medullary substance, as that when is impressed alone, its latter part shall not be such as the sole impression of A requires, but lean towards B, and end in b at last. But B will not excite a in a retrograde order, by supposition, the latter part of B was not modified and altered by A, but by some other vibration, such as C or D. And as B, by being followed by C, may at last raise c, so b, when raised by, in the method here proposed, may be also sufficient to raise c, inasmuch as the miniature c being a feeble motion, not stronger, perhaps, than the natural vibrations N, requires only to have its kind, place, and one of direction, determined by association, the heat and arterial pulsation conveying to it the requisite degree of strength. And thus associations, as well as in synchronous ones, according to the proposition.²

Several significant achievements drawn from these excerpts may be credited to Hartley. He had "created" a relationship, plausible for his

time, between bodily function and mental processes neglected by Locke because of his lack of interest, by Berkeley because of his mentalistic stance, and by Hume because of his scepticism. Hartley restored the body as the physical basis for mental interconnections including motor activities; ideas are associated with movements. He formalized the doctrine of association by making it central to his writings and used it to explain all mental life, rather than making it incidental to other concerns and other principles as had his predecessors. And, he made contiguity the fundamental law of association.