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Hermann Lotze's Concept of Function: Its Kantian Origin
and its Impact on Evolutionism in the

United States

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Historische Reihe Nr. 6

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DISKUSSIONSPAPIER Nr. 36

A substantial secondary literature (e.g., Kuklick, 1977, Wiener, 1949) points to the source of pragmatic philosophy and functional psychology in the so-called Metaphysical Club which met informally in Cambridge, Massachusetts during the 1860's and 1870's. The leader of this Club was Chauncey Wright, a gifted philosopher without academic position whom Charles Darwin had personally asked to extend his theory into "the evolution of self-consciousness." Wright combined John Stuart Mill's inductive logic with natural-selection theory to account for the development of our reasoning powers. A key factor for Wright was language, which he connected with the "empirical memory" for signs of objects (Madden, 1963). Another factor was behavior: here Alexander Bain's definition of belief as an idea on which we are prepared to act was emphasized by several younger members of the Club. These three ingredients - language, behavior, and belief - were brought together in an inductive psychological process which explained the development of mind by analogy to the mechanisms of variation and selection in natural evolution.

As compelling as was this theory of mental development, Wright's younger protégées Charles Peirce and William James found it deficient in one respect. Wright's theory was based on an inadequate account of induction. To remedy this defect, Peirce and James turned to the German philosophical tradition. The interface between Mill's "induction" and Kant's "transcendental deduction" became one important source for post-Darwinian American philosophy. This coalescence of British, German, and American philosophical traditions around the problem of the evolution and function of mind is the topic of this paper.

German Sources of Pragmatic Philosophy

Paul Kuntz has recently called attention to the influence of Hermann Lotze on Anglo-American philosophy (Kuntz, 1971), while the scope of his influence has been portrayed by John Passmore (1968). Passmore noted that Lotze was "the most pil-laged" philosopher in the nineteenth century. William James's careful study of Lotze was the topic of a series of articles by Otto

F. Kraushaar in the 1930's (1936, 1938, 1939, 1940). Meanwhile, Lotze's recognition as one of the leading figures in German philosophy is indicated by his call to succeed Herbart at Göttingen in 1844 (Woodward & Rainer, 1975) and by his subsequent calls to Leipzig, Bonn, Tübingen, and Berlin (three times).

The Kantianism which Lotze represented to American philosophers was derived, in turn, from aspects of the thought of Jakob Friedrich Fries at Jena (Gregory, in press). Although this connection has not been recognized hitherto, it is an important clue to the continuity of Kant's thought in the nineteenth century. Lotze studied at Leipzig in the 1830's, and he came to know Fries personally through a close friend from his home town of Zittau, Ernst Friedrich Apelt (1913-1857). Apelt was then a student, and eventually the successor, of Fries. He is recognized today among philosophers of science (e.g., Buchdahl, 1973) for answering Whewell's The Philosophy of the Inductive Sciences in 1847 with his book Die Theorie der Induction in 1854.

Apelt's theory of "rational induction" was based on "leading maxims," and these in turn were derived from two types of hypothetical inference called modus ponens and modus tollens. In short, Apelt introduced an early form of hypothesis-testing by means of a falsificationist logio. This historical fact is acknowledged by Sir Karl Popper in the recently published original manuscript for his Logik der Forschung, called Die beiden Grundprobleme der Erkenntnistheorie (Popper, 1979 [1930-33]). In comparison to Popper, however, Apelt was closer to the mathematics of his day. He expressed rational inductions in terms of mathematical functions of the form $y = f(x)$. Functional analysis was a mathematical tool for describing continuous lines, such as occur in organic forms. Unfortunately, the early death of Apelt prevented him from incorporating important developments in mathematics during the 1850's and 1960's into his theory of scientific method.

Hermann Lotze went beyond Apelt in two respects: he clearly distinguished between hypothetical inference as a feature of human reasoning and as a theory of scientific method; and he clarified the use of mathematical formulas such as $y = f(x)$ in both cases. Lotze was less mathematically adept than Fries and Apelt, yet he had the advantage of contact with members of the Göttingen mathematical school, including Carl Friedrich Gauss, Lejeune Dirichlet, Richard Dedekind, and Bernhard Riemann. From them he learned the benefits of algebraic notation for the logic of scientific methods. Gottlob Frege, who heard Lotze lecture at Göttingen in the 1870's took this idea further in his Begriffschrift of 1879. We shall not follow the history of symbolic logic further here (cf. Sluga, 1980), but shall turn instead to the American philosophers who drew upon aspects of Lotze's Logik of 1874.

Before going into detail concerning the reception of Lotze's logical ideas in the United States, we offer the following overview. Lotze's Logik contained three sections: on reasoning, on scientific method, and on theory of knowledge. Generally speaking, Charles Peirce and William James drew upon the first section, John Dewey developed the second section, and James Mark Baldwin elaborated the last section. The significance of demonstrating the borrowing of Lotzean ideas by American philosophers is that it fills in a kind of missing historical link between Kant and Hegel, on the one hand, and pragmatism on the other.

Lotze and Charles Peirce

According to Murray Murphey, Charles Peirce sought a metaphysics of "evolutionary love" which went through four stages (1961). In each stage Peirce was concerned to relate the "community of investigators" to the knowledge they create. In 1866, for example, he correlated the three figures of the syllogism with deduction, induction, and the hypothesis. This is of interest because it involved roughly the same concern

as Apelt's and Lotze's, namely the effort to bring classical logic into closer relation to the way scientific thinking proceeds. Peirce was not centrally concerned with Apelt and Lotze, but rather with the reformulation of Kant's functions of judgment. Peirce did express admiration for Lotze's demonstration that scientific laws can be expressed by the universal judgment, the conditional judgment, or the disjunctive judgment (1901). However, the significance of comparing Lotze and Peirce is largely limited to acknowledging a certain parallel in their loosening up of classical logic. This led toward a communal definition of scientific knowledge through testing hypotheses (abductions) "in the long run" (Apel, 1973).

Lotze and William James

James's essay on "Brute and Human Intellect" in 1878 depicts an alternative to Wright's inductive account of "The origin of Self Consciousness" by recourse to the Kantian tradition. In developing his view of "mental selection" for the ontogeny of mind, James argued that humans reason by choosing the "reason" or "means", m, which connects two otherwise dissimilar ideas, A and Z; he was critical of the "ideally perfect" diagram of the subsumption of S under P (Figure 1) when he pointed out that "only so far as we are right in identifying in our thought the total A and the total Z, with their ingredient, m, and in ignoring the outlying portions of the circles, can we reason from one to the other" (Figure 2) (1878, pp. 242-43). Surely James took this argument from a variety of sources, including Spencer, Wright, Jevons, and Bain. But the distinctive feature was the active nature of "mental selection," and this he could not have derived from the so-called British associationists and their successors who based induction on laws of the association of ideas. The marginal comments of James in his copy of Lotze's Logik of 1874 reveal one source of this argument. Using the classical term "judgment" rather than the natural history term "selec-

tion," James wrote in the margin that "the judgment expresses a relation of two contents, not two ideas" (Lotze, 1874, p. 57, § 36). He went on elsewhere in the margin to write that we justify this relation by specifying the conditions x under which S is P (Lotze, 1874, p. 564, § 347).

While James was unreceptive to the mathematical notation employed occasionally by Lotze to express logical propositions, his marginal notes to Lotze's Logik nevertheless contain the equation " $S = f(P)$ " and a running summary of the hypothetical inference underlying it (Lotze, 1874, p. 142, § 114). Thus it seems reasonable to look for similarities, as well as differences, between Lotze's and James's concept of function, since James became known in psychology for his "Functionalism" (cf. Woodward, in press). In 1890, in his methodological chapter "The Methods and Snares of Psychology" in the Principles of Psychology, we find echoes of Lotze's concept of function. Regarding method, James warned against the "psychologist's fallacy" or "the confusion of his own standpoint with that of the mental fact about which he is marking his report" (1890, vol. 1, p. 196). This methodological warning was implied in Lotze's repeated distinction between the "mechanism" by which ideas are connected in experience and the "critique" which we exercise upon it in scientific thinking. However, James equated the "mechanism" with those psychologists who ascribed associative or mentalist (faculty) processes to mind, and the "critique" with the naturalistic process of mental selection, as he understood it, in the mind of every psychological observer or subject. In his final theoretical chapter on "Necessary Truths and the Effects of Experience," James applied this methodological insight to the evolution of scientific knowledge as we share it with others; citing Lotze (1874, pp. 550-72, § 342-51), he wrote: "What we experience, what comes before us, is a chaos of fragmentary impressions interrupting each other; what we think is an abstract system of hypothetical data and laws" (1890, vol. 2, p. 634). John Passmore saw this attempt "to

depict the stages through which thought passes" as characteristic of Hegel and Lotze, as well as Bradley and Bosanquet (Passmore, 1968, pp. 165-66). James differed from all of them, however, in recognizing the need for a phylogenetic explanation, in addition to an ontogenetic one. James thus went beyond Lotze's logical and mathematical concept of function in his theory of reasoning, his theory of mental development, and his theory of scientific method.

Lotze and John Dewey

John Dewey was even more explicit in his critique of Lotze and appropriation from him, yet this influence was less profound than in the case of James. Dewey never would have thought to acknowledge Lotze as the general for the American troops in psychology, nor to compliment him for his "exquisite style." Lotze served the narrower purpose of a foil for him. In the lead chapter to his anthology, Studies in Logic, in 1903, Dewey adopted Lotze's distinction between the antecedent conditions of thought, the datum of thought, and the content of thought. From these three factors he constructed his own formula of thought as a response to stimuli in a certain situation. From this instrumental definition it was but a short step to the formula, response = f (stimulus), which has come to underpin the methodology of the social sciences in the United States.

Dewey tried to put theoretical distance between himself and Lotze in the following way. He viewed Lotze as holding a notion of absolute reality to which thought adjusts; thought is "a mere tool" which is eventually thrown away. For Dewey, by contrast, there could be no "separation between an independent thought-material and an independent thought function" (1903, p. 79). To make such a distinction between matter and function of thought, wrote Dewey, is to commit the psychologist's fallacy: "Lotze is continually in this dilemma: thought either shapes its own material or else just accepts it" (1903, pp. 36-37). For Dewey, thought is not the scaffolding which the

carpenter throws away, but the framework which supports the building. In a modern restatement of such an instrumentalism, Thomas Nagel wrote that "the pertinent question about theories is not whether they are true or false but whether they are effective techniques for representing and inferring experimental phenomena" (1961, p. 133).

Conclusion and Prospect

It is customary to accept Darwin in particular, and Darwinism in general, as the intellectual force behind the movement toward pragmatism and instrumentalism in American philosophy. Various definitions of the concept of function would seem to support this interpretation. Darwin certainly viewed mind in terms of its function in the survival of the species, and Darwinism construed knowledge as the product of a naturalistic evolution. Yet on the face of the present evidence, the conceptions of "abduction," "mental selection," and "instrumental logic" each have antecedents in the writings of Lotze, and through him to Apelt, Fries, Hegel, and Kant.

There is no need to dichotomize the history of philosophy in America into a question of Kant or Darwin. This paper has simply sketched the Kantian side of the history of philosophy. The other side has been adequately treated elsewhere. To accept less than a composite picture including both traditions would do an injustice not only to history, but to the cumulative nature of philosophical thinking. To uncover the roots of American thought in the European tradition is not to take away from its originality but to enhance its legitimacy as a genuine intellectual revolution.

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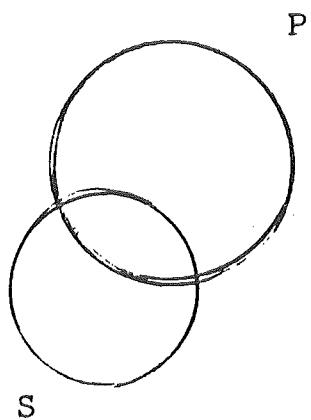


Figure 1. The subject *S* is subsumed under the predicate *P* in the second figure of the universal affirmative judgment, e.g., "All gold is yellow." (From Lotze, 1885, p. 37).

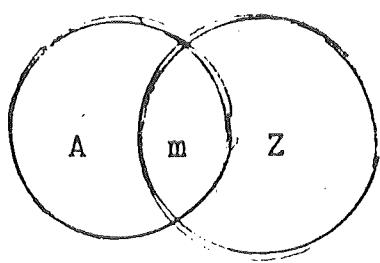


Figure 2. Two data, A and Z. In the theoretic sphere m is the "reason" for "inferring" Z; in the sphere of action it is the "means" for "attaining" Z. (From James, 1878, p. 241).

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