Book Reviews

Emotion and Personality. vol. 1, *Psychological Aspects*. vol. 2, *Neurological and Psychological Aspects*. Magda B. Arnold. Columbia University Press, New York, 1960. xiv + 296 pp.; xvii + 430 pp. $7.50 each.

You may have reflected on the subtle retirement of William James from the psychological scene—James with his phenomenology and "test of reason," without the "rigor" of measurement, *t*-tests and *P*-values, information theory, cybernetics, or vacuum tubes. James's panoramic mixture of idealistic, realistic, and pragmatic philosophy, though quite possibly underbudgeted for sex, could, nevertheless, anticipate reverberating circuits and cell-assemblies (whatever value these may have in understanding the brain) without denigrating man. James is still very much alive. The scholarship, method, and rhetoric of Magda Arnold's volumes are Jamesian throughout.

Theorists ranging from theologians to physiologists have long pondered the causal relation between perceived object, emotional experience, and associated bodily changes. In general three main solutions have been advocated: that perception arouses emotion and then emotion causes bodily changes; that perception induces bodily changes which are felt directly as emotions; that perception arouses both emotion and bodily changes. Arnold offers a fourth solution to this classical problem. She holds the view (based upon a tightly reasoned argument) that emotions are aroused (experienced subjectively) not by perception directly but by an instantaneous appraisal of what we perceive; that emotion is a tendency to some sort of action appropriate to this appraisal, accompanied by a pattern of physiological alterations in body state.

Volume 1 presents a scholarly review and critical examination of past and present thought on the subject of emotions. It also educes a four-factor model: perception-appraisal-emotion-action based in part upon laboratory and clinical studies of human behavior. I sense some convergence in this model with recent laboratory analyses of thinking behavior in terms of phase sequences and other constructs. This is perhaps not surprising since the "same" brain subserves both cognition and conation.

Volume 2 examines the known physiological and neurological evidence and attempts to demonstrate that the theoretical formulation presented in volume 1 is consistent with and supported by such data. Here the argument is less than compelling. For example, emotion is a relatively prolonged state and there is little known neurophysiology to account for such states. Furthermore, the assumption is made, but not examined, that all modulating influences in the brain are reflected directly in neural transmission. Memory traces are heavily implicated in the appraisal aspect of the new theory and may or may not fit this assumption. Arnold suggests that the instantaneous appraisal is mediated by the "limbic system" of the brain, which is defined to include the subcallosal, cingulate, retrosplenial and hippocampal gyri (entorhinal cortex and adjacent presubiculum), and the island of Reil. The effects of selective ablation and of specific psychopharmacological agents on this system are examined in some detail.

Prologue to the Science of Emotion

It is noteworthy that Arnold addresses this communication to scientists. Walter Miles once told me of receiving a letter from Sigmund Freud expressing surprise that anyone would ever take his propositions to the laboratory for testing. Students of brain-behavior relations will welcome the departure from the theorists' usual procedure, which has been to start with neurological findings and speculate as to what these findings could mean. In the words of Arnold: "Such an approach overlooks the fact that we must know the exact sequence of psychological processes before we can identify the structures that mediate it." In any event, our *appraisal* of Arnold's theory must in important respects be quite different from the scientific assessment of its validity for brain functioning. These volumes represent a timely prologue to a science of emotion.

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Smithsonian Treasury of Science. Webster P. True, Ed. Simon and Schuster, New York, 1960 (in cooperation with the Smithsonian Institution). xvi + 1208 pp. Illus. 3 vols., boxed, $15.

These volumes contain 50 essays on popular science, selected from the 3000 that have been published since 1846 in the *Annual Reports* of the Smithsonian Institution. The essays run the gamut of a century of science and of speculation about science, and for the most part they are well written and enticing, sober yet informative articles written for the intelligent layman. Whenever possible, with those articles that have been recently outdated, the editor has prevailed on the author or on another expert to provide a suitable addendum. For each essay, the editor has also added a short introductory note, explaining the essay's importance and saying something about the author.

However, all the addenda and pious introduction cannot conceal the fact that this is a rehashing job, hardly worthy of being enshrined in three volumes (boxed) and put out as a popular conspectus of the whole of science. Though it contains writings by Einstein, Pierre Curie, H. G. Wells, and Marconi, it is but an anthology from a noncommercial, scientific, annual publication, and few of its articles have the status of masterpieces of the art of science writing. They were not intended to be that. As Leonard Carmichael remarks in his introduction, the Smithsonian's function of the "diffusion of knowledge" has always been accomplished through its scientific publications; but only *to a limited extent* have its publications been directed towards the general public. The limited extent has always been well performed by the Smithsonian's own lights; no one