Questions in Embryology

Essays in the History of Embryology and Biology. JANE M. OPPENHEIMER. M.I.T. Press, Cambridge, Mass., 1967. 384 pp., illus. $12.50.

For many years Jane M. Oppenheimer, professor of biology at Bryn Mawr College, has been writing and delivering thoughtful papers on the history of embryology. An embryologist herself, she is one of the few scholars who have attempted to wrestle with the complex history of embryology in the 19th and 20th centuries. Those historians and biologists who are already familiar with her contributions will rejoice to find that her papers have at last been brought together under a single cover. Those who have yet to discover her writings will now have an opportunity to do so. The fact that she is exploring a dimly lit byway makes this collection especially welcome.

Included in the volume are 13 essays and a postscript. The first essay deals almost exclusively with Embryological Concepts in the Twentieth Century, and from here the essays wend their way backward in time, alighting seriatim at such key figures and historical problems as Harrison, Boveri, Roux, inherent problems of experimentation, Haeckel, embryology and Darwin, the specificity of the germ layers, von Baer and causal analysis, and John and William Hunter, until finally they terminate with William Gilbert: Plant Grafting and the Grand Analogy. Oppenheimer has purposefully run history in reverse; "the design of the volume is . . . intended to conduct us from what we know best toward what we see only more dimly" (p. vi). Well over two-thirds of the book, however, stays within the range of the 19th and 20th centuries, and it is within this scope that she makes her most valuable contributions.

When a historian of science reads a historical account written by a professional scientist, he instinctively expects to find the "layer cake" tradition in the interpretation of past events. In other words, a survey of a specific discipline is too often viewed as a linear progression of positive achievements leading unswervingly to the current and hence correct state of affairs. One of the most valuable assets of Oppenheimer's essays is that she avoids this all-too-compelling pitfall. Perhaps only in The Non-specificity of the Germ-Layers does she portray a smooth progression, and it is worth noting that this essay, by far the oldest in the volume, was written in 1940. In the other essays Oppenheimer is concerned with specific problems in a given historical setting. To what extent could Darwin have been influenced by von Baer's fifth scholium? What was the conceptual relevance between Gilbert's plant grafting and his *De magnete*? Were there causal concepts buried in the descriptive details of von Baer's *Entwicklungsgeschichte* (1828–37)? What sort of questions were Haeckel, Roux, Harrison, and others asking about embryos, and to what extent were the answers dictated by the form of the questions? In fact, the reader can almost envision Oppenheimer treating history itself as a developing embryo (embryos don't develop rectilinearly!); she knows full well that each stage has its own function and responds according to the manner in which it is provoked.

It would be a mistake, however, to view this volume as a full survey of 19th- and 20th-century embryology. These are essays written at different times and for different purposes, and as such they collectively present their own historical fallacy. An essayist, after all, can ask exactly the questions that interest him at the moment and can disregard everything else. So if I may offer a single criticism of an important contribution, it is that Oppenheimer has confined herself to problems that are of current concern to embryologists. Thus one finds a valuable discussion of von Baer's "causal analysis" but no critique of his relationship to *Naturphilosophie*; one finds a careful discussion of the relation between Harrison's hanging-drop experiment and his concern for the origin of symmetry but no elaboration of the contemporary controversy over the origin of the nerve fibers; and one finds a full discussion of the assumptions made by Haeckel which should interest modern embryologists yet an intentional disregard of Haeckel's biogenetic law.

But Oppenheimer has handled those problems of her own choosing with a fine historical touch, backed by extensive reading into the primary sources and by insights that only an experienced embryologist could have. Her fifth essay, on Analysis of Development: Methods and Techniques, is the high point in this respect. Future historians of embryology will do well to consider carefully what Oppenheimer has to say, for, in my estimation, these essays form the necessary starting point for any further work in the history of embryology.

This volume of reprinted essays is handsomely produced, but sadly for the public of students who should use it, it is far overpriced.

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Biochemistry of Psychotic Phenomena

Amines and Schizophrenia. A symposium held in Atlantic City, April 1965. HAROLD E. HIMWICH, SEYMOUR S. KETY, and JOHN R. SMYTHIES, Eds. Pergamon, New York, 1967. 300 pp., illus. $11.50.

The lack of success in finding a single cause for schizophrenia despite a search of more than half a century has led most workers in the field to feel that this illness or group of illnesses is probably the result of a complex interaction between genetically and environmentally determined factors. One attempts to explain how psychological and metabolic events might lead to the disordered associations and to the autism and ambivalence that are characteristic of the illness. Presumably, the function or organization of neural elements must be disordered for these behavioral manifestations to occur.

Although the psychotomimetic drugs produce a true psychosis only in latently psychotic individuals, they do, in different individuals at different times, produce mental changes which include some of the symptoms of schizophrenia. Hence it is possible that endogenous compounds similar to these might be involved in the symptomatology of some forms of schizophrenia.

In 1952 Smythies, Osmond, and Harley Mason suggested that, since mescaline was a trimethoxy derivative of the normal metabolite dopamine, aberrant *O*-methylation might be responsible for some symptoms of schizophrenia. Later discoveries that *N*-methylated indoleamines are also psychotomimetic led to the more general hypothesis that aberrant transmethylation of catecholamines and indoleamines might be a basic biochemical mechanism in schizophrenia.