

HISTORY AND SCIENCE

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A Study of the Relation of Historical and Theoretical Knowledge. By Hugh Miller. Pp. xi+201. (Berkeley, Calif.: University of California Press; London: Cambridge University Press, 1939) 12s. net.

THIS is a valuable and interesting, though somewhat difficult, book of which the avowed purpose, as we are told on the cover, is to "free empirical science from the ghosts of the rationalistic past which still haunt and mislead its progress". It is well worth reading for the variety of thoughts which it expresses, although one is bound to say at the end that the solution offered is not as clear as the apprehension of the difficulties which surround its approach.

The author explains his theme in a short biographical introduction in which he says that from the earliest years he has been perplexed by the opposition of the two sorts of thinking which are constantly presented to our minds; one he calls theoretical science and the other historical science. (One must note, by the way, that his habitual use of the word 'theoretical' in this restricted sense rather adds to the difficulty of reading his book.) But the main gist and purpose are clear enough. We have on one side a body, let us say, of conclusions or doctrines of which mathematics seems to be the most perfect, which stand firm and rise above the tide of historical change. Thus the equality of two and two to four is apparently a fixed and unalterable truth (the author would say a 'theory'). On the other side we have the constantly changing facts of organic life, of which he ascribes the discovery rather too exclusively to Darwin. Man is the highest product of these, and we have to assume that the mind of man which is his highest—or at least most peculiar—feature has also changed through the ages. How then are we to reconcile the eternity and permanence of what he calls "theoretical science" with the infinite change and growth of the organic side of the universe which is best represented to us in man? It is a pretty problem, and Prof. Hugh Miller follows it through three books and twelve chapters with great persistency and a good deal of enlightenment. He cites numerous philosophers from the earlier Greeks down to Bergson and, if it were not for a confession of faith in the preface, one would be inclined to say that the historical or changeful side of thought wins all the way. In fact the

closing words of the last chapter are a moving appeal to history. "Action is our last honesty. Let us act—we have surmised enough—and show what our hearts are bent upon. Let us allow the appeal to history and in the name of history, fight".

This appeal goes home to the heart of the present reviewer, who has always held that history—especially the history of science—was the most important part of intellectual progress and should be made a leading feature in our educational courses. Science has grown and is constantly changing and we—outside Nazi Germany—are trying to keep pace with it. In that sense above all we would echo the eloquent epilogue of Prof. Miller and "in the name of history, fight".

Yet one cannot turn one's back on all the great conclusions of the thinkers of the past; one must still believe that two and two make four, even though our earliest ancestor may have thought the same thing. The answer to the whole dilemma is clearly a compromise, as the author indicates in his preface. There are certain constant structures of fact and thought which stand firm throughout the evolutionary process. Just as every animal form needs some food to sustain it, so it is constantly true that two and two make four. On these and a good many other permanent truths the mind feeds and grows.

We have in the present state of knowledge a long perspective of the past evolution of life which has given us an entirely new orientation towards history. All life is history, and this historical life has from the first and throughout a basis of non-evolutionary science. The living side now includes geology; it cannot be said to include either physics or astronomy, although we are always on the track of some evolutionary explanation of the heavenly bodies. Mathematics, however, in its foundations appears unaffected by the changes of organic life. Man discovers transcendental numbers but he does not create them. The mathematical foundation of our universe of knowledge appears to come from a distinct source from that of life. Is it—as Sir James Jeans has suggested—that God, as the mathematician, has working with him a co-adjutor or another side of His being which comes to its highest force in men's minds? The mathematical foundations remain secure while life develops in infinite richness of variety.

It is these and similar thrilling questions which Prof. Hugh Miller raises in his thoughtful book.

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