

as his opinion, after inspecting the dyeing schools in Germany, Austria, and the United States, that they are not to be compared, as regards equipment or efficiency, with the schools at Manchester, Bradford, and Leeds. This is true enough, but is not generally recognised.

With regard to trade research, it is pointed out that the amount actually carried on must not be gauged by publications in technical journals. The most valuable results obtained are, of course, used by individual firms, and it is only gradually that they become known and find a place in the literature. This is no argument against the many schemes of research initiated by industries as a whole. It is often stated that information which is the common property of an industry is of no special value to an individual firm; but this is a fallacy, as it is in *applying* new information in particular directions that individual enterprise, skill, or special facilities have full scope.

The new edition of the book has been largely rewritten throughout, with great advantage. The concluding section deals with the future prospects of the dye-manufacturing industries in Britain, France, and the United States. W. M. G.

#### OUR BOOKSHELF.

*An Introduction to a Biology, and Other Papers.*

By A. D. Darbishire. Pp. xviii+291. (London: Cassell and Co., Ltd., 1917.) Price 7s. 6d. net.

SINCE the advent of natural selection the mechanistic interpretation of Nature has on the whole steadily gained ground among biologists. The trend has been more and more towards the translation of vital phenomena in terms of physics and chemistry. Much of modern investigation, such as the discovery of artificial parthenogenesis or the establishing of the Mendelian principles among the phenomena of heredity, has undoubtedly strengthened the mechanistic position. Yet to all action succeeds reaction. To-day there is an evident tendency in many quarters to cast on one side the mechanistic interpreter and seek out other prophets. The note sounded thirty years ago by the acute and critical intellect of Samuel Butler is finding echoes among biological workers. Such a one was the author of this book. The "Introduction to a Biology" was designed, we are told, to direct attention to the failure of modern interpretative biology and to suggest the direction in which an understanding of life may be sought. Unhappily the work is but a fragment cut short by the author's premature death.

The principal theme is that the intelligence of man is of utilitarian origin developing gradually as he gradually acquired more and more control over his material surroundings. Hence the circumstances of its development have led to man's welcoming a mechanistic theory of the organism and a materialistic theory of evolution to the neglect of other points of view. The influence of Bergson is clearly marked not only in the

thesis, but in the generous use of entertaining analogy.

The essay, however unconvincing, is brightly written, for the author had a style of candid freshness and a gift of investing even trivial things with humorous interest. The charm of his personality is well brought out in the brief biographical sketch by his sister, upon whom fell the labour of piecing together what he left behind. It should be added that the greater part of the book consists of Darbishire's papers reprinted from various sources.

*The Secretion of the Urine.* By Prof. A. R. Cushny. ("Monographs on Physiology.") Pp. xi+241. (London: Longmans, Green, and Co., 1917.) Price 9s. net.

IN this extremely valuable monograph Prof. Cushny gives an admirable account of the kidney, and discusses the various views held as to its functions. Many other matters, such as the action of drugs upon it and the changes that occur in disease, are included, and the bibliography appended is of a most complete kind. The centre of interest in the book, however, is the presentation of the author's own views on the theory of kidney activity. The main theories discussed are naturally those associated with the historic names of Bowman and Ludwig. Bowman's view, with modifications introduced by Heidenhain and others, is at the present time the one most favoured by the majority of physiologists; Prof. Cushny's view, which he terms the "modern view," is a modified Ludwig hypothesis: secretion (a pure filtration) occurs at the glomerulus, and this fluid is converted into more concentrated urine by reabsorption which takes place in the tubules.

The author criticises the Bowman-Heidenhain theory that secretion of urea, etc., occurs in the tubules, partly because he interprets Heidenhain's celebrated pigment experiments in a new way, but mainly because it is vitalistic. His own theory reduces the "kidney to a machine," instead of postulating for it the capacity of a trained analytical chemist. It is a little difficult to follow the author here, for in some pages the reabsorption which he supposes to occur is spoken of as being indiscriminate and mechanical, while in other places he speaks of the kidney-cells as rejecting the urea instead of reabsorbing it, and in one place at least (p. 44) he says that reabsorption depends on the *vital activity* of the epithelium, and in so doing drops into an expression which is anathema to him as a rule. It really does not matter what word we employ—secretory, selective, or vital; but by whichever name we call it, selective action is undoubted in the case of other secretions, and in the kidney, whether the substances pass through its cells in one direction or the other, the cells do exercise discrimination. Prof. Cushny argues that discrimination implies intelligence; he might just as well urge that the amoeba is intelligent because it rejects non-nutritious particles.