

as from tissue components, for example, the amino-acids, arginine and glycine. This is taken as further evidence against the concept of two independent (exogenous and endogenous) types of catabolism. H. H. Mitchell, on the other hand, appears to hold that tissue creatine is very constantly undergoing dehydration to creatinine (which is eliminated by the body as a useless metabolite); that it is being constantly formed, and that the rate of its synthesis cannot be readily accelerated by an over-abundance of its precursors in the tissues, nor by the administration of amino-acids. The author, however, considers that creatine and creatinine represent uniform rather than constant metabolites, and their formation and excretion are governed by the rate of protein metabolism, and that Mitchell has not really offered evidence to refute Schoenheimer's views.

There is at present a considerable difference of opinion as to whether the feeding of gelatin (with its high content of glycine), or glycine itself, will increase the energy output in man. In Prof. Beard's experience only 75 per cent of a given number of individuals will show increases in energy output, with the other 25 per cent exhibiting nothing after glycine or glycine-urea ingestion. This he considers to be a normal physiological variation between individuals and should be recognized as such. It is held by the author that glycine will not form creatine unless a normal or high protein diet is fed at the same time, as otherwise the glycine or the amino-acids hydrolysed from gelatin will go first to meet this demand. Although the author believes in the beneficial action of glycine the case for glycine is, on the balance of evidence, 'not proven'.

Much of what is described here is still highly controversial and is certain to stimulate much discussion. If a fault may be found it relates to the author's enthusiasm for the role of glycine in the treatment of varied clinical conditions. It is here that he will probably encounter most criticism; but although his account appears to have this bias it will most certainly have been of value if it stimulates further work.

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## PLASTICS MADE EASY

### Plastic Horizons

By B. H. Weil and Victor J. Anhorn. (Science for War and Peace Series.) Pp. ix+169. (Lancaster, Pa.: Jaques Cattell Press, 1944.) 2.50 dollars.

**T**HIS little book is worth careful examination, for it may represent the kind of thing with which the public is fed or doped in the days to come. In the 'blurb' on the dust cover it claims to take up where the newspaper articles and institutional advertising leave off. It is a back-to-earth job in which curiosity and interest in plastics will be supplanted by actual working knowledge. To use the author's favourite expression it may, and then again it may not.

The book starts well from the conception that we can scarcely help noticing the world around us: countless changes begin to intrigue our fancy and stimulate our imagination. This is largely true of America, thanks to a Press which is more and more prepared to direct attention to the progress of science and to display attractive advertisements which make names and processes known to a public which is ready to accept anything new. It is far from true of Great

Britain, where the masses are conservative. Proof of this is afforded by the reception given to the 'Portal House', which represents quite the finest step forward in domestic engineering of this century. The British Press has not yet learned to talk about science, its occasional efforts are too often characterized by exaggeration and inaccuracy, our advertising is poor. Scientific workers as a class do not want publicity, least of all that which is associated with a particular name, often the wrong one.

Assuming we have an interest, such as our forefathers did, in the things we use, what can we learn about plastics? The word is now an accepted one though it involves a contradiction, and we use it as descriptive of a large number of substances which the chemist makes of the most diverse properties—billiard balls, 'Nylon' stockings, telephones, glues and lacquers. I think we should encourage the definition that the chemist makes them from a few simple substances which he can procure quite inexpensively in quantities of thousands of tons, for it leads to the next question, How does he make so many different things from these few starting materials? The authors plunge us into structural chemistry and are not afraid to cover several pages with structural formulae, which inspires a wholesome respect for it and the molecular engineers who follow its precepts. The phrase is a good one, for those who engage in synthetic chemistry are 'molecular engineers' building up from small molecules, with only two atoms of carbon, and thus comparable with bricks, a mighty structure composed of thousands of molecules. These molecular chains vary; when they are long and contain little interlinkage they can be worked and re-worked and are termed thermoplastic. But if there is much cross-linkage between the chains the first heating sets up a rigid molecular structure and the product is thermo-setting.

The authors get us thus far in fifteen pages, and it will be admitted that they have done a good job in getting the idea of molecular structure across. The book goes on in this fashion, telling us about moulding, about particular resins, how they are made and from what materials—our interest is continually stimulated. But people are most interested in uses, for war to-day and for peace purposes to-morrow, so we are told something about these. This section is rather superficial and too much a catalogue without indication of the why and wherefore of its use: the chapter is below the standard of the early part of the book. The authors have more scope when they come to synthetic fibres and synthetic rubber, two things about which the public really want to know; the chapter contains a lot of information and an indication of the competition to be faced.

The final subject, plastics and the future, is one which gives scope for the enthusiast; but the authors, while stimulating, are commendably restrained. Plastics will supplement rather than supplant the traditional structural materials, applications will multiply, prices will grow less, the versatility of the materials will find new uses for them, but we are not on the eve of a plastics age nor will their use solve all the problems of man.

I have written enough to show that I find this a readable book, written on a high level though essentially popular, and one which would help in the understanding of what the chemist is doing and can do if it could only reach a large section of the public. I think it fulfils the authors' aspirations.

E. F. ARMSTRONG.