

penicillin-producing molds. This aspect of the problem has been presented by Kenneth B. Raper of the Northern Research Laboratory, Illinois. Biochemical aspects of penicillin-producing moulds have been discussed by M. J. Johnson of the University of Wisconsin; a comparative study of the metabolic changes accompanying the tray and tank fermentations, has been made. An article on the production of antibiotic substances by actinomycetes has been contributed by S. A. Waksman himself who is responsible for discovering streptomycin.

The second part of the volume is devoted to a discussion of the pharmacological aspects of antibiotics. Those interested in antibiotics will find in this volume a clear and authoritative exposition of the various aspects of the problem of antibiotics.

Amino Acid Analysis of Proteins. By William H. Stein and others. Edited by Roy Waldo Miner. (*Annals of the New York Academy of Sciences*, New York, Vol. 47), 1946. Pp. 57-240.

Progress in any branch of science is often arrested on an account of certain difficulties inherent to the subject and remains at a stage of disheartening stagnation until a new method of approach is discovered or a new experimental tool of research is forged. Advances in the chemistry of proteins have for some time been rather slow but during the last few years, the analytical approach to the study of proteins has been perfected with a precision which is truly astonishing.

The present number of the *Annals* represents an invaluable contribution to the subject of amino acid analysis of proteins; these methods of analysis, applicable as they have been shown to be to micro-quantities of proteins, have already played a fundamental part in giving us an accurate and complete picture of the amino acid make up of many important groups of proteins. Of particular interest and of essential importance are the two methods of iso-

tope dilution and the more simple but equally accurate and highly specific microbiological method of estimating amino acids.

The advantages of the microbiological methods are beautifully summarised by Hans T. Clarke in the concluding portion of the volume. "Their specificity is high, they are applicable to fantastically small amounts, and their precision is astonishingly great, particularly in view of the uncertainty which always attaches to procedures involving living systems. Although it seems unlikely that they will soon be placed upon a theoretical basis, a brilliant future can safely be predicted for these methods."

Referring to the isotope dilution method, the same author says, "The isotope dilution method, which, theoretically, should yield results of particular value as absolute standards of reference for testing the validity of other analytical procedures, can at present be carried out only in the few laboratories in which a mass spectrometer is operated. If isotope analytical services, available to any research worker, are organised, the isotope dilution methods will become more generally useful."

Those interested in the composition and empirical formulæ of proteins will find the article on "Amino acid composition of simple proteins" extremely illuminating. Thanks to the accurate methods of analysis; it has been possible to determine the amino acid made up of a number of crystalline, homogeneous and integrally pure proteins, e.g., lactoglobulin and insulin and arrive at an empirical formulæ in terms of its amino acid residues. This represents a fundamentally important advance, which has been rendered possible through the analytical approach.

The volume which is well documented with all important references to literature, will be warmly welcomed and widely read by every one interested in the advancement of protein chemistry.

DECENTRALISATION OF INDUSTRIES AND PREVENTION OF WARS

ADDRESSING the scientific workers of the Indian Institute of Science, Acharya J. B. Kripalani, President, Indian National Congress, invited the attention of the audience, to the misuse of the discoveries and inventions of science by political adventurers and dictators, who lacked a moral and humanitarian background. Knowledge is power and the possession of power without the restraining capacity to regulate its use in a moral and discriminating way will only lead to terribly disastrous consequences. There was a period when we might have been able to eliminate wars. The nineteenth century idealists dreamt that such a period was near at hand. But scientific research helped to perfect instruments of destruction and rendered warfare far more terrible and destructive. Scientists could not shirk their responsibility in this matter.

Proceeding, Acharya Kripalani declared, "But science has come to stay; we have to face it and its consequences." He asked, "Can not science so devise means and methods that in-

dustries which are so heavily centralised, are decentralised?" If industries are decentralised, wars will, at least not be mechanised to the extent they are. Scientists can help to decentralise industries and introduce into the villages specially designed small machines powered by flexible electric power, and thus contribute to an eradication of most of the evils flowing from centralisation. These small machines can only make what they are intended to and would not lend themselves to be converted overnight for the manufacture of the modern weapons of war.

"My appeal to you as scientists is this. Let us make the world a simpler place to live in. Please forget that science should conquer Nature. Nature is a terrible force and it will have its own revenge. Let your aim be to co-operate with, and not conquer Nature. Work 'with' nature. Fabricate small machines which the villager and his family can work at home with electric power and thereby help to decentralise industries."