oxidising agent, opens up one of the most fruitful and spectacular fields of research.

Proteolytic enzymes are discussed by Bergman and his associate, while the non-proteolytic enzymes is reviewed by Tauber. Valuable reviews on the metabolism of carbohydrates, fats and proteins and amino acids appear in the present volume. Special attention should be invited to the reviews on Detoxication mechanisms and Harmones. Dieticians and pediatricians will find the review on Nutrition, illuminating and instructive. Reviews on soil deficiencies and animal nutrition and spectrometric studies in relation to biology, appear for the first time in this series. The latter review is presented in a form so as to be useful to those who wish to interpret spectroscopic data.

Barker's review on the chemistry and metabolism of bacteria discusses the nutrient and vitaminic requirements of micro-organisms and gives a survey of the work subsequently stimulated by the remarkable discovery of Wood and Workman regarding the utilisation of carbon dioxide. Other reviews relate to nitrogen fixation, protein monolayers, mineral nutrition of plants, plant-growth substances, bioluminiscence, water- and fat-soluble vitamins, biochemistry of nucleic acids, purines, pyrimidines, creatine and creatinine, sulphur compounds and carbohydrates and glycosides. The usual high standard has been maintained and the principal object of these reviews, a critical appraisement of the year's work, and a speculative but promising forecast of the future, has been more than amply fulfilled. We fervently wish that the present conflict will not in any manner affect the publication of this Annual which has come to be regarded as a landmark in the progress of Biochemistry.

Mechanism and Chemical Kinetics of Organic Reactions in Liquid Systems. A general discussion arranged by the Faraday Society. (Messrs. Gurney & Jackson, Ltd., London), 1941. Pp. 601 to 806. Price 15*sh.* 6*d.*

The book is a collection of papers contributed to a discussion in September last. Soon after the *Transactions of the Society* for December containing these papers was received in this country, a brief critical review was published in *Current Science* (Vol. 11, p. 202).

In 1937, the Faraday Society held a discussion on Reaction Kinetics in general and the present publication is a logical sequel. The earlier work dealt largely with the theoretical treatment of activation energy and reaction velocity, while the present one is naturally concerned with the application of these ideas. The fourteen papers that have been presented clearly indicate a unity of purpose, an application of exact technique together with physical understanding. The series of papers also draws attention to the necessity of a theory that envisages both the collision and the transition state methods of interpreting chemical reactions.

The publication is an illuminating work suggestive of further work in a rich field and should find a place in the library of every chemist.

Carnegie Institution of Washington: Year-Book No. 40, 1940-41. (Carnegie Institution of Washington, Washington, D.C.), 1941. Pp. xxxii + 346. Price $1.00 paper cover, $1.50 cloth binding.

The Carnegie Institution of Washington, which "occupies a unique and important place in the scientific affairs" of the United States of America, is dedicated to "the extension of man's fundamental knowledge of his environment". The report of the President which prefaces the Year-Book, outlines the way in which the scientific activities of the Institution have been oriented to meet the situation imposed on the Nation by war. "Events of the past two years have profoundly altered the plans and outlook of every scientific institution in the world, and of the great majority of individual scientists." Many of the long-range programmes of research in the field of pure science have now been changed or held in abeyance.

In discussing the function of scientific institutions in relation to the programme of defence the President writes: "There is not complete unanimity in this country as to how, or when, or to what extent the power of the nation should be exerted to defend our way of life. There is substantial unanimity, however, on the thesis that the power of the nation should be increased as rapidly as possible and to the maximum possible extent. Here the Institution has a very

definite duty. Military strength has been definitely demonstrated to depend, in no inconsiderable degree, upon the intelligent application of science to military devices and operations. As a great and unique scientific organisation of national extent, with its central offices close to the seat of Government, the Institution has a duty far beyond that of responding passively to the calls of Government for the loan of the services of members of its staff. It is called upon to participate actively, in co-operation with other scientific groups, in bringing to the aid of Government the co-ordinated intense effort of the scientists of this country, supplementing the activities of the armed services, in order that the weapons placed in the hands of the youth of the land may be fully adequate. The scientists of the Institution are discharging this duty to the full extent of their ability and opportunity."

The Carnegie Corporation of New York, through whose munificence the scientific activities of the Institution are kept alive, has recognized that the continued maintenance of the prominence of an Institution, involves the intensification of efforts in new directions and new approaches to old problems by the adoption of new methods offered by modern instrumentation. In pursuance of this progressive and enlightened policy, the Institution has installed a large cyclotron to attack the many borderland problems between physics and biology. A study has also been undertaken toward a new approach to human genetics.

While a substantial portion of the resources of the Institution are now harnessed for prosecuting the defence programmes, the administration has not overlooked the importance of keeping the fountain of fundamental research flowing. The President remarks: "Fundamental scientific research is almost completely stopped all over the world, except in this hemisphere. The inspiration passed from master to disciple, and the subtle evolution of great ideas when powerful minds collaborate, or compete, are part and parcel of the rapid progress of modern science. This implies continuity of effort. If the thread is broken it may be long before it can be mended. With science and scientists in other lands completely distracted by immediate requirements, an organization such as ours has a responsibility for preserving some of the more important threads in tact. This duty has not been forgotten, although its fulfilment becomes increasingly difficult." **M. S.**

CENTENARIES

Wright, Benjamin (1770–1842)

BENJAMIN WRIGHT, known as the father of American Engineering, was born in Wethersfield, Connecticut, October 10, 1770. Having a talent for mathematics, he studied surveying and he persuaded his father who was a petty farmer to move into the new settlements of New York and carried out land surveys of over 500,000 acres between 1792 and 1796.

As the area developed Wright interested himself in improving its transport facilities by constructing canals. The experience which he thus built up got for him a prominent place in the construction of the Erie Canal in 1817 which he completed in 1825. In executing the work, he gathered around him a remarkable group of young men all of whom afterwards developed into engineers of first quality and thus earned for Wright the familiar appellation 'Father of American Engineering'.

Wright died in New York City, August 24, 1842.

Reynolds, Osborne (1842–1912)

OSBORNE REYNOLDS, a British physicist, was born at Belfast, August 23, 1842. His father who was fourth wrangler and a school master, paid personal attention to his son's education and had admitted him into the workshop of a mechanical engineer before he entered the Queen's College, Cambridge. He graduated in 1867 as the seventh wrangler and became the first professor of engineering in the Owen's College, Manchester. This post he held till his retirement in 1905.

During his long tenure of professorship Reynolds made many investigations most of which sought to find mechanical explanations of physical phenomena like lubrication, flow of water in pipes and the concept of critical velocity, dilatancy of granular media, and group velocity of waves. The most extensive piece of experimental work he carried out was the determination of the mechanical equivalent of heat by the direct measurement of the amount of heat required to raise a pound of water from the freezing point to the boiling point.

Reynolds became a fellow of the Royal Society in 1877 and got its gold medal in 1888. His *Papers on mechanical and physical subjects* were published in three volumes in 1900-03.

Reynolds died in Somerset, February 21, 1912.

S. R. RANGANATHAN,
University Library,
Madras.