

organoids. There is also an excellent account of the changes that occur in cells during embryogenesis, differentiation, and secretion. These include the development of the notochord, the differentiation of white adipose tissue, the secretion of the thyroid gland, the formation of collagen by fibroblasts, and the development of spermatocytes and oocytes. The last part of the book is devoted to a survey of the dividing cell and its ultrastructure during mitosis and meiosis. It is the special merit of this work that a detailed description of structure is well correlated with aspects of function. Indeed, the description of the plasma membrane in relation to the specialization of the cell and its environment is masterly, as is also the comparison drawn between it and the membranes which enclose the nucleus, endoplasmic reticulum, mitochondria, and lysosomes. The accounts of cell division are quite remarkable in their comprehensiveness. In view of the adequacy of the treatment given to each subject it is unfortunate that the style of presentation is dull and unimaginative. The writing does not flow, and in some places great concentration is needed to grasp the author's meaning.

The book is copiously illustrated, and many of the pictures are excellent. If fewer had been selected there would have been a better opportunity for greater enlargement of the remainder; as it is some pages are rather crowded with small prints which are difficult to interpret. Nevertheless, the overall production is good, and the price is not excessive for the information provided. This book should find a welcome place in every laboratory where intimate cell structure is being investigated.

MARTIN ISRAEL.

Welch's Era

William Henry Welch: And the Heroic Age of American Medicine. By Simon Flexner and James Thomas Flexner. (Pp. 539+x; illustrated. 28s. 6d.) London: Constable. 1968.

William Henry Welch is an important figure in the history of American medicine, for it was largely due to his influence that scientific medicine advanced greatly in the United States during the period 1890-1930. This biography, though shorter than Cushing's *Life of Osler* and Fulton's *Life of Cushing*, ranks with them in both importance and interest.

Born in 1850 in the small town of Norfolk, Connecticut, where his father was in general practice, Welch studied classics at Yale and medicine and surgery at the New York College of Physicians and Surgeons. He was an intern at Bellevue Hospital, and on the advice of some of his teachers he then spent two fruitful years working in physiological and pathological laboratories in Germany under the best teachers—Cohnheim, Ludwig, Hoppe-Seyler, von Recklinghausen, Wagner, Weigert, and others. At that time there was no similar laboratory in the United States and Welch determined to help fill the gap. When he returned to New York in 1878 he began to give classes in practical pathology and soon became known as a clever teacher, but he refused to embark upon a clinical career. In 1884 he received an offer from Dr. Gilman to join the staff of the projected Johns Hopkins Hospital in Baltimore. He accepted the offer, went for a year to study bacteriology under Koch, and then proceeded to undertake pathological research and plan the new medical school in Baltimore. His

standards were high and a good beginning was made with Osler, Mall, Halsted, and Kelly, but money was lacking to open the medical school. The situation was saved by three rich and clever women who partly gave and partly collected half a million dollars which they presented to the Johns Hopkins on condition that the high standard of entry was maintained and that women would be admitted under the same conditions as men. The school was then opened in 1893 with 14 men and three women in the first class, but before long it was full of eager students, and Welch acted as dean for two years.

Welch almost always had some research project on hand, but he is best known for his discovery of the bacillus of gas gangrene, Welch's bacillus. For 40 years he was in the van of progress of scientific medicine. From 1901 he was president of the Board of Scientific Directors of the Rockefeller Institute, and it was Welch who was largely instrumental in getting the Johns Hopkins University School of Hygiene founded. His work with the Army during the first world war, his help given to the Red Cross cause, and the energy and time he gave in combating tuberculosis deserve to be specially mentioned. He worked hard until he had passed his eighty-third birthday, but then developed an incurable malady from which he died in 1934. Welch's success was due to his wide knowledge and wisdom, his good temper and patience, and his persistence in keeping the main end in view. He had hosts of friends but maintained a reserve on his secret thoughts. He never married.

I strongly recommend this very readable and instructive biography.

ZACHARY COPE.

Books Received

Review is not precluded by notice here of books recently received.

Antibiotic and Chemotherapy. Second Edition. By Lawrence P. Garrod, M.D.(Camb.), Hon. LL.D.(Glasg.), F.R.C.P., and Francis O'Grady, M.D.(Lond.), M.Sc.(Lond.), M.C.Path. (Pp. 475+viii; illustrated. £2 10s.) Edinburgh and London: E. & S. Livingstone Ltd. 1968.

Length of Gestation. A Study conducted amongst 1,013 married pregnant women, residing in Sadder Area of Lahore Cantonment. By Asghari Khanum Awan, M.D., B.S.(Punjab), M.P.H.(Harvard). (Pp. 84+xi; illustrated. Price not given.) Lahore: Maternity & Child Welfare Association of Pakistan. 1967.

Untersuchungen von Blut und Knochenmark. By Horst Stobbe, Annemarie Jastram and Vera Siegesmund. (Pp. 241+xiii; illustrated. £2.) Berlin: Veb Verlag Volk und Gesundheit. 1968.

Biochemistry of Glycoproteins and Related Substances. Cystic Fibrosis Part II. Edited by E. Rossi and E. Stoll. (Pp. 322+xiv; illustrated. £7 10s.) Basle and New York: S. Karger. 1968. Distribution in the U.K.: Academic Press.

Advances in Planned Parenthood. Volume III. Edited by Aquiles J. Sobrero, M.D., and Sarah Lewit. (Pp. 120+vii; illustrated. £3 2s. 9d.) Amsterdam, New York, London, Paris, Milan, Tokyo, Buenos Aires: Excerpta Medical Foundation. 1968.

Commitment to Welfare. By Richard M. Titmuss. (Pp. 272. £1 10s.) London: George Allen & Unwin Ltd. 1968.

Les Goitres Simples. By J. Vignalou and J.-P. Bouchon. (Pp. 190; illustrated. 38 F.) Paris: Librairie Maloine S.A. 1968.

Garlock's Surgery of the Alimentary Tract. By John H. Garlock, M.D. (Pp. 494+xi; illustrated. £8 4s.) London: Butterworth. New York: Appleton-Century-Crofts. 1967.

Drugs Affecting the Central Nervous System. Volume 2. Edited by Alfred Burger. (Pp. 437+xv; illustrated. £9.) London: Edward Arnold (Publishers) Ltd. New York: Marcel Dekker, Inc. 1968.

Men and Medicine in the Middle East. By Jan Simon. (Two copies received.) (Pp. 241; illustrated. Copies available on request.) Alexandria: W.H.O. 1968.

Views of Medical Education and Medical Care. Edited by John H. Knowles. (Pp. 178+ix; illustrated. £2 5s. 6d.) Cambridge, Massachusetts: Harvard University Press. 1968. U.K. Distributors: Oxford University Press.

Plants Harmful to Man in Australia. By D. F. Francis and R. V. Southcott, M.D., D.Sc. (Pp. 53; illustrated. \$1.00 (Australian).) Adelaide: Botanic Garden. 1967.

Fluoreszenzangiographie der Retina. Lehrbuch der Retina. By Achim Wessing and G. Meyer-Schwickerath. (Pp. 212+x; illustrated. DM. 84.) Stuttgart: Georg Thieme Verlag. 1968.

Textbook of Dermatology. (Two volumes.) Edited by Arthur Rook, M.D., F.R.C.P., D. S. Wilkinson, M.D., F.R.C.P., and F. J. G. Ebling, D.Sc., Ph.D. (Pp. 1-1016+xvi and 1017-1964+xvi; illustrated. £21 the set.) London and Edinburgh: Blackwell Scientific Publications. 1968.

Biological Psychiatry. A Review of Recent Advances. By J. R. Smythies, M.D., M.R.C.P., D.P.M., Alec Coppen, M.D., D.P.M., and Norman Kreitman, M.D., D.P.H. (Pp. 112+viii; illustrated. £1 0s. 10d.) London: William Heinemann (Medical Books) Ltd. 1968.

Design and Analysis in Dental and Oral Research. By Neal W. Chilton, D.D.S., M.P.H. (Pp. 365; illustrated. No price given.) Philadelphia and Toronto: J. B. Lippincott Co. 1967. Distributed in Great Britain by Pitman Medical Publishing Co. Ltd., London.

Radiation Protection Standards for Radio-luminous Timepieces. Drawn up by a Joint Group of Experts of the European Nuclear Energy Agency and the International Atomic Energy Agency. (Pp. 37. \$1.00.) Vienna: International Atomic Energy Agency, 1967. U.K. supplier: H.M.S.O.

Course on Dust Prevention in Industry. (Occupational Safety and Health Series No. 8.) No editors given. (Pp. 162; illustrated. Free.) Geneva: International Labour Office. 1967.

The Care of Radiation Casualties. By John Blakely, M.D., D.P.H., D.I.H. (Pp. 139+viii; illustrated. £1 10s.) London: William Heinemann (Medical Books) Ltd. 1968.