

respiratory centre in the brain was showing signs of failure.

An outstanding instance of Henderson's shrewdness in the application of knowledge gained in the laboratory to the solution of practical problems in everyday life is afforded by his work on carbon monoxide poisoning. In severe cases of carbon monoxide poisoning, the best method hitherto advocated for treatment was by inhalation of oxygen; yet this was often disappointing since, as he showed, the respiratory centre had already begun to fail owing to the serious deficiency of oxygen to which it had been subjected because of the displacement of oxygen from the haemoglobin in the blood by carbon monoxide. By adding 5 per cent or more of carbon dioxide to the oxygen inhaled, he found that the increased stimulus to the respiratory centre antagonized its failure, and with the maintenance of effective breathing the rate of elimination of carbon monoxide from the blood was greatly accelerated and a far better opportunity afforded for the eventual resuscitation of the victim. Oxygen-carbon dioxide inhalation is now universally recognized as the best treatment for carbon monoxide poisoning.

Henderson showed, too, that similar treatment might have a far wider application in clinical medicine when stimulation of the breathing or the maintenance of hyperpnoea might be requisite, for example, in the resuscitation of the new-born baby, in accelerating the elimination of volatile anaesthetics through the lungs after surgical operations, or in improving the breathing and reducing the risk of atelectasis in inflammation of the lungs. He had, however, an uphill fight before his views gained acceptance. Many regarded carbon dioxide as a poison the elimination of which from the lungs ought to be promoted and not hampered, and it took time to bring home the idea that carbon dioxide was also a natural stimulus to the breathing and could rightly be used for this purpose in clinical medicine.

Henderson's wide knowledge of the general physiology of respiration introduced him to many other practical problems. He was associated with the U.S. Bureau of Mines in the design of mine rescue apparatus and in the detailed investigation by which standards of ventilation were fixed for the ventilation of the Holland Tunnels between New York and New Jersey so as to prevent any risk of carbon monoxide poisoning caused by the heavy motor-car traffic. During the War of 1914-18, he worked on the physiological problems of aviation, and, after the start of gas warfare, on the properties of poisonous gases and means for securing protection against them; this led to the publication in 1927, in collaboration with H. W. Haggard, of his well-known book "Noxious Gases", a monograph which was to serve as the basis for the treatise "Schädliche Gase" by Flury and Zernik, which was published in 1931 in Berlin.

Much of Henderson's work is summarized in his book "Adventures in Respiration", published in 1938, and this affords an insight into the way in which his ideas developed and the difficulties that he faced and overcame.

A stout friend and a doughty opponent, Henderson retained throughout his working life the enthusiasm and the vigour of his youth. He had the courage of his convictions and really enjoyed a battle of words and wits, and he could speak bluntly in argument. But whether one agreed or disagreed with him, his views were always worthy of serious consideration. That he made mistakes is no doubt true, for no one

is infallible; but there is no question that he played a great part in the development during the present century of our knowledge of the wide field of physiology embraced in the term 'respiration', and in the application of this knowledge to practical problems. It can rightly be claimed that his work on resuscitation has saved many lives that would otherwise have been lost.

C. G. DOUGLAS.

#### Mr. H. H. Brindley

By the death on February 18 of Harold Hulme Brindley, science lost a great personality. He was born at Highbury on June 17, 1865, the son of the then recorder of Hanley. Educated at Mill Hill School, he entered St. John's College, Cambridge, in 1884. Here he shared in all undergraduate activities, rowing in the boats, lieutenant in the Volunteers, president of the Debating Society, finally taking honours in the Natural Sciences Tripos in 1888. Careless of examinations, he obtained inspiration by aiding Weldon and Bateson in a period which was largely devoted to measurements designed to ascertain the technique of natural selection. An article on variation in the number of joints in the cockroach's tarsus greatly influenced Bateson, for it showed perfection with no intermediates whether there were four or five joints, each a 'normal' form, a 'discontinuous and total variation'. The facts were contested, as in regeneration a four-jointed tarsus is common, but he maintained his position, finding a case of four-jointed tarsi on all six legs. This led him later to a study of regeneration in general, especially in insects and vertebrates. His experiments on the different instars of Lepidoptera were particularly interesting.

Brindley then turned to the earwigs, with their long and short forceps. He scouted the idea that they were distinct species, a view extended to *Xylotrupes* beetles, two forms each with its fluctuations yet markedly discontinuous. For many years he kept cages of earwigs to experiment on their feeding habits and reactions. He found that their capture of insects by their forceps in their nocturnal excursions was important, but they could live healthily on purely plant-food, though preferring dead animal matter. Dahlias and roses were mainly of use as hiding places, though their petals were agreeable. For their natural control, birds, except starlings, were unimportant. For proportions of sexes and other enumerations, he collected in the Scilly islands, but we recall with most interest his study of their parasitic infections. *Clepsidrina* abounded in the hind gut, while gordiid thread worms up to 50 mm. long often destroyed the whole gut; there were also acarine mites and fungoids, but parasitism did not produce any difference in respect to high and low males.

While collecting earwigs all over Cambridgeshire, Brindley also took the molluscs, obtaining more than a hundred species, and he observed that the progressive drainage of three centuries had not resulted in any marked invasion of Wicken Fen by terrestrial forms. Annual excursions to Arcachon were for the purpose of studying the larval processions of the moth, *Cnethocampa*, these first described by Réaumer. He broke up natural into artificial processions, but the question of direction is still undetermined. Mass attacks for oviposition were continuously made by tachinid flies, countered largely by the urticating properties of the larval hairs. During all these periods, indeed for fifty years, he had charge of the

first M.B. teaching in the Zoological Laboratory at Cambridge, more than five thousand students passing through his hands. He declined preferment, for the low pay of those days made private coaching necessary, while there were then no grants available for his research purposes. He became steward of his College during 1914-23, finally being elected a fellow in 1931.

Meantime Brindley had attained high distinction in other fields. He was a keen member of the Cambridge Cruising Club, and his knowledge of ships was unsurpassed. Hardy (later Sir William) had him and Graham Kerr as crew on his *Raven*, when she was the first yacht to pass westward through the Kiel Canal. He was one of the founders of the Society for Nautical Research in 1911, and he never missed a council meeting for twenty-eight years. He was a prolific writer in its journal, his chief subject the

medieval ship. This and a love for St. Christopher led him to many ports and gave play to his artistic abilities, a study of medieval glass giving him great joy. He put his chief trust in engraved seals, and extended his research to every seaport in Europe. He arranged a special room for them in the National Maritime Museum at Greenwich, to which he gave his own unmatched collection. These settled the dates at which the rudder replaced the steering oar and the use of reef points. He was also an authority on primitive sailing craft.

Here was a character with a genius for friendship, equally at home in the discussions of art, literature and science, at first a noted contributor to the advance of biology, later a historian of nautical evolution, always the inimitable and humorous word-painter of the many noted personalities he had met, a real lover of life.

J. STANLEY GARDINER.

## NEWS and VIEWS

Prof. A. R. Todd, F.R.S.

PROF. A. R. TODD has been appointed professor of organic chemistry in the University of Cambridge as from September 1944. Prof. Todd received his early education at Allan Glen's School, Glasgow, and passed from there to the University of Glasgow where, after a brilliant academic career, he graduated in 1928 and commenced his first research under the direction of Prof. T. S. Patterson. In October of the following year he went to work with Prof. W. Borsche in the University at Frankfurt-am-Main, where as a Carnegie Research Scholar he studied the chemistry of certain bile acids, and in 1931 presented the results of this work in the form of a thesis for which he was afterwards awarded the degree of Ph.D. On his return to England, he was elected to a Senior Studentship of the Exhibition of 1851 and worked for the next three years in the research laboratory of Sir Robert Robinson at Oxford. For his researches on the synthesis of anthocyanins during this period he was awarded the degree of Ph.D. At the invitation of the late Prof. G. Barger, he moved from Oxford to Edinburgh in 1934 to take up the study of the chemical constitution of vitamin B<sub>1</sub>. The skill with which he led his team during this period and finally determined the structure of the vitamin, and of its fluorescent oxidation product, thiochrome, established his reputation as an outstanding organic chemist.

IN 1936 the Governing Body of the Lister Institute invited Dr. Todd to continue his researches in the Biochemical Department, and for the next two years he and his co-workers investigated the nature of the groupings responsible for the characteristic physiological action of vitamin B<sub>1</sub> and completed the synthesis of a number of compounds structurally related to the vitamin. Dr. Todd became a reader in biochemistry in the University of London in 1937. During his stay at the Lister Institute, he continued his researches on the constitution of the anti-sterility vitamin (vitamin E) and engaged in many other topics which included the chemistry of certain anthelmintic drugs and the active principles of *Cannabis indica*. In 1938 Dr. Todd was appointed professor of chemistry and director of the Chemical Laboratories in the University of Manchester, and with the increased facilities available at this famous

centre of research, he was able to engage in an ever-widening array of synthetic and constitutional problems. Prof. Todd was elected a fellow of the Royal Society in 1942. Chemists and biochemists throughout the country will wish him every success and happiness in his new appointment.

### Royal Commission on Population

IT is announced that the Royal Commission on Population has been constituted as follows: Lord Simon (*chairman*); Prof. A. M. Carr-Saunders, director of the London School of Economics; Sir Hubert Henderson, of the Treasury, formerly joint secretary to the Economic Advisory Council; Prof. A. W. M. Ellis, regius professor of medicine in the University of Oxford; Dr. Ethel Cassie, formerly senior assistant medical officer of health for maternity and child welfare, Birmingham; Lord Cranbrook, deputy regional commissioner for the Eastern Civil Defence Region; Lady Dollan, wife of a former Lord Provost of Glasgow; Mr. R. C. K. Ensor, research fellow of Corpus Christi College, Oxford; Mr. J. R. Hobhouse, of Messrs. Alfred Holt and Co., Ltd., Liverpool; Mrs. Margaret Jay, a member of the L.C.C.; Mrs. Gwen Longmoor, wife of a West Hartlepool factory worker; Mrs. G. P. Hopkin Morris, wife of the B.B.C. regional director for Wales; Lady Ogilvie, wife of the former director-general of the B.B.C.; Mrs. Helen Pawson, area representative for Wales of the W.V.S.; Mr. A. Roberts, general secretary of the Association of Card Blowing and Ring Room Operatives; and Mr. W. Dunkeld Robieson, editor of the *Glasgow Herald*.

Associated with the Royal Commission will be the three following technical committees: *Statistical Committee*: Prof. A. M. Carr Saunders (*chairman*), Mr. V. P. A. Derrick, Dr. D. V. Glass, Mr. R. R. Kuczynski, Mr. J. G. Kyd, Mr. H. Campion, Mr. A. Reeder, Dr. P. Stocks, Mr. F. A. A. Menzler and Mr. G. H. Maddex. *Economics Committee*: Sir Hubert Henderson (*chairman*), Mr. E. C. Ramsbotham, Prof. Alexander Gray, Prof. J. R. Hicks, Mr. W. B. Reddaway, and Mrs. Joan Robinson. *Biological and Medical Committee*: Prof. A. W. M. Ellis (*chairman*), Prof. E. D. Adrian, Prof. D. Baird, Dr. P. H. F. Bishop, Dr. C. P. Blacker, Mr. Eardley L. Holland, Dame Louise McIlroy, Dr. A. S. Parkes, Mr. E. W. Riches,