OBITUARY NOTICE.

ARTHUR BECKET LAMB.

1880—1952.

THE present century has witnessed a vast and many-sided development of chemistry in the United States, and few are the aspects of this movement which have not profited by the life-work of Arthur Lamb.

He was born in Attleboro, Massachusetts, on February 25th, 1880, the son of Louis Jacob and Elizabeth Camerden Townsend (Becket) Lamb. During an acute illness in early childhood he was pronounced dead by the attending physician, but was afterwards revived through the persistent efforts of his mother. As a boy, he was exceptionally precocious, with a consuming interest in natural phenomena. The superintendent of schools, who had a good telescope, furthered Arthur's ambition to search for double stars. Eager to study the organisms in nearby ponds, he constructed, in the machine shop of his father's factory, quite an elaborate microscope; the lenses, only, were purchased ready made. At sixteen, already a senior in high school, his imagination was kindled by the discovery of *X*-rays, a precursor of the scientific revolution in which he was destined to have so important a part. In the same year, with a group of school friends, he produced an *X*-ray photograph, using a Crookes tube and a static machine available in the school laboratory.

As a freshman in Tufts College at Medford, Massachusetts, he planned a " major " in zoology, and spent a summer's vacation at the Marine Biological Station in Harpswell, Maine. But the vivid personality and scientific zeal of Professor Arthur Michael diverted his interest to organic chemistry. During his senior year, he undertook a research problem in that subject. In 1900, he received the bachelor's degree, and in addition the master's degree in zoology.

In September of 1902, on the eve of his departure for the Johns Hopkins University in Baltimore to continue graduate study in organic chemistry, he was persuaded to confer with Theodore William Richards of Harvard, later Nobel laureate. He was at once impressed by the possibilities of physical chemistry, then in its infancy, and so decided to devote his energies to Richards. In the laboratory of the latter, he constructed a most ingenious apparatus for precise calorimetric measurements with aqueous solutions. In 1904, he was awarded the degree of Ph.D. in organic chemistry at Tufts, and the degree of Ph.D. in physical chemistry at Harvard.

The following autumn, he went to Germany as a post-doctoral fellow. At Leipzig, Heidelberg, and Goettingen, new vistas were opened up for him by Luther, Ostwald, Bredig, and also by Haber. Some years later, his translation of Haber's classic book on the thermodynamics of technical gas reactions sharpened interest in that vitally important subject.

In the academic year 1905—6, while instructor in electrochemistry at Harvard, he was called to New York University, where he presently became a professor of chemistry and the director of the Havemeyer Laboratory. But in 1912 he returned to Harvard, this time for good.

Upon the entrance of the United States into the first world war, Lamb joined the group which was being assembled at the American University in Washington, D.C., and which later became the Chemical Warfare Service. His broad coverage of chemistry and of biology enabled him to discern the fundamental issues in a host of extremely insistent problems. Among these were the improvement of charcoal and other absorbents for gas masks and the elimination of toxic smokes. The filters devised for the latter purpose had proved inefficient and had hampered breathing, but Lamb showed that a portable electrostatic precipitator could serve much better. In Michael's laboratory he had worked on iodine pentoxide, and now with the co-operation of Charles R. Hoover of Wesleyan University he employed this substance in a device for detection of carbon monoxide. Other chemists, working under Lamb's direction, developed " Hopcalite," a catalyst for oxidation at ordinary temperatures of that same gas, then as now, a menace in tanks and in gun turrets. As the Chief of the Defence Division, with the rank of Lieutenant Colonel, he visited Europe. Later, he related with glee how as the highest-ranking officer present, he was suddenly called upon to conduct a military ceremony without the slightest advance knowledge of its intricate details.

Following the Armistice, he was summoned to organize and to direct the Fixed Nitrogen Research Laboratory in Washington, D.C. Here, in association with other leading scientists,

the reaction rates and the equilibria involved in the manufacture of synthetic ammonia were investigated, using a great variety of catalysts, and covering a wide range of temperatures and pressures. The subsequent vast expansion of this industry in the United States was based upon these fundamental studies. The Chemical Warfare Service, and also a large chemical corporation, now made tempting offers, but 1921 found him back at Harvard as a professor of chemistry and the director of its chemical laboratory.

Long before then, it had been evident that the inadequate space, bad ventilation and outmoded facilities of old Boylston Hall were strangling the teaching and the research work of the department. Lamb was active in the campaign which ultimately provided funds for the Mallinckrodt and Converse Laboratories, and he then assumed responsibility for the many technical problems involved in their construction and equipment. He had to reconcile the traditions of the architects with the ambitious demands of his own colleagues and with a shrinking dollar. As director of the new buildings, he continued to deal with human problems in addition to executive and scientific responsibilities. Presently, Radcliffe College asked him to design and supervise the construction of Byerly Hall, which had to provide, in a relatively small space, independent quarters for four different sciences.

On the educational side, also, Lamb was a commanding figure. For nearly thirty years, he conducted the large elementary course. His group of graduate students was not especially numerous, but its members were devoted to him, and quite a few of them achieved real distinction in later years. He became Erving Professor of Chemistry in 1929, and served as Dean of the Graduate School of Arts and Sciences from 1940 to 1943. He became Erving Professor Emeritus in 1948.

Space is lacking here for an adequate review of his scientific work. A part of this has been mentioned above. As early as 1913, with his student R. E. Lee, he constructed a device for comparison of densities of salt solutions by means of a magnetic float controlled by a variable electric current. In the course of this investigation, he proved that densities of water samples from various sources differed by almost one part in a million, even after elaborate purification. He thus foreshadowed the discovery of heavy water. In later years, his chief research interests were centred upon reaction rates and equilibria involving cobaltammines. With the help of research assistants, he successfully attacked many scientific problems from government organizations and from the chemical industry. He held sixteen patents, most of which had to do with his work in the Chemical Warfare Service and at the Fixed Nitrogen Research Laboratory.

Few men could have superposed upon the above-described activities the responsibilities as Editor-in-Chief of the Journal of the American Chemical Society. In his Priestley Medal Address (*Chem. Eng. News*, 1949, **27**, 2841) he has described at length the phenomenal growth of the Journal during his thirty-year incumbency, and the details of the smoothly-running organization which he developed. The volumes of this publication are his greatest monument, since adequate presentation and wide circulation of scientific data are almost as important for development of science as research itself. His standards were indeed uncompromising, and at times they irked many a prominent contributor; but they were combined with fairness, tact, and a determination to salvage everything of value in the most unpromising manuscripts. Great was his solicitude for the young and inexperienced. More than once he was seen coaching beginners in the art of scientific presentation and in literary style. Time and again, he rewrote entire articles after their authors had failed to supply adequate revisions; and through the years, each month, he shepherded authors, referees, associate editors and a secretarial staff toward the deadline—the day when the Journal went to press.

Lamb was the recipient of practically every honour which could come to an American chemist. Among learned societies should be mentioned the American Academy of Arts and Sciences, the American Philosophical Society, the Washington Academy of Sciences, and the National Academy of Sciences. He was an Honorary Fellow of the Chemical Society. Tufts conferred upon him the honorary degree of Doctor of Science in 1923. In 1933 he was elected President of the American Chemical Society. He was awarded the William H. Nichols Medal in 1943, and in 1944 the first of the Ballou Medals established for recognition of eminent Tufts alumni. Most coveted of such distinctions is the Priestley Medal of the American Chemical Society, which came to him in 1949.

Lamb's friends will always think of him first as a human being. He was an enthusiastic tennis player, and during summer vacations he hiked and climbed in Switzerland, the Tyrol, or the Canadian Rockies. He was a member of the exclusive American Alpine Club. In Brookline, where he lived for many years, he was a trustee of its public library and active in the work of the Boy Scouts. But it was in his home that loyalty and devotion reached their fullest

stature. In 1923, he married Miss Blanche Anne Driscoll, a lady of great artistic ability, and of rare courage in the face of agonizing physical ailments which beset her in later years. Their two children, David Becket and Deborah Anne, survive them.

Throughout his brilliant career, everyone marvelled at Lamb's prodigious energy, but in 1947 came the sudden realization that his heart had been overtaxed. Warnings disregarded, he was enabled by expert medical advice and an equable disposition to continue on a crowded schedule for five years more. In September, 1951, after his attendance at two scientific meetings, his malady was aggravated. He died suddenly on May 15th, 1952, while riding homeward at the end of a busy day.

G. S. FORBES.