

OBITUARIES

On 28 April 1950, Professor **Oakes Ames** (1874-1950) passed away at his winter home in Ormond, Florida, in his seventy-sixth year. Internationally known, particularly as a leading orchidologist, his botanical and horticultural activities were devoted with equal success and enthusiasm to research, to teaching, and to administration for more than half a century at Harvard University.

Son of Oliver Ames, a financier and once Governor of the Commonwealth of Massachusetts; and Hannah Coffin Ray Ames, and grandson of Oakes Ames, one of the builders of the Union Pacific Railroad, Oakes Ames was born in North Easton (near Boston), Massachusetts, on 26 September 1874.

His interest in horticulture and botany began early in life, 'when, as a boy, he joined his father . . . in the hobby of collecting and identifying the wild flowers of the New England countryside. Young Ames, setting for himself the goal of learning the name of one new plant each day, began a serious study of the local flora of North Easton, and, with a tin biscuit box to serve as a vasculum, he roamed the woods and countryside, imagining himself to be exploring strange and distant lands '*.

He prepared for his university career at Noble and Greenough School in Boston and entered Harvard College in 1894, receiving his A.B. in 1898 and his A.M. from the same institution the following year.

Immediately after receiving his A.M. degree, he began his teaching activities at Harvard, serving from 1900 to 1910 as Instructor of Botany. In 1915, he was named Assistant Professor of Botany, a chair which he held until 1926 when, under President A. Lawrence Lowell, he was appointed Professor of Botany. He served his University in this capacity for six years. Then, from 1932 to 1935, he held the chair of Arnold Professor of Botany and, from 1935 to 1941, Research Professor of Botany. In 1941, Ames retired from his teaching duties, holding the title of Research Professor of Botany, Emeritus, until his death. In 1927, he was named by President Lowell as a member of the Administrative Board of the Graduate School of Arts and Sciences, and, in 1929, as Chairman of the Committee on General Examinations.

Although it is difficult, if not impossible, to consider Ames's teaching and research apart from his administrative activities, so closely were they allied, we may enumerate his administrative appointments separately. From 1898 to 1909, he served as Assistant Director of the Botanical Garden, taking over its complete administration as Director for the next thirteen years, from 1909 to 1922.

As early as 1900, Ames, with Professor George Lincoln Goodale, was influential in persuading Mr. Edwin F. Atkins of Boston to establish the Atkins Garden in Cuba. Ames administered this as a dependency of the Botanical Garden in Cambridge for a number of years, since President Lowell refused for some time to grant the Cuban Garden independent status as a branch of the University. Ames's efforts on behalf of the new-born tropical garden, though not officially recognized by the University, are recorded in his annual reports to the President.

In 1923, he became Curator of the Botanical Museum, a post he held until 1927, when he was appointed Supervisor of the same institution. Later he was named Director of the Botanical Museum by President James B. Conant. He filled this post with characteristic enthusiasm from 1937 to 1945, when, at his own request, he became Associate Director, relinquishing active administration but preserving, until the time of his death, a vital interest in the current research and publications of the Museum.

* All the quotations marked with an asterisk in this notice are from the biographical sketch by P. C. Mangelsdorf in *Orchid in retrospect*, by Oakes Ames (1948), ix-xv.

One of the most demanding of administrative periods during Ames's half century of service at Harvard was from 1927 to 1935, when he was Chairman of the Council of Botanical Collections and Supervisor of the Biological Laboratories as well as of Harvard's Botanical Garden in Cuba and the Arnold Arboretum. This exacting appointment followed the brilliant work he carried out as Chairman of the Committee on the Future Work and Needs of the University in Biology, a post to which he was named in November 1926 by President Lowell.

During this whole period, Ames was active in enlisting additional financial support and in creating new entities for biology at Harvard. As Supervisor of the Arnold Arboretum, he more than doubled the endowment of that institution by raising the Charles Sprague Sargent Memorial Fund. The Biological Laboratories at Harvard owe much to his efforts and foresight, for, as Chairman of the Building Committee and subsequently as Supervisor of the Biological Laboratories, he was a leader in drawing up the plans and constructing the large and modern building now housing most of Harvard's experimental biology. Furthermore, he was instrumental in raising extensive financial support for this building and, later, he guided the difficult pioneer amalgamation of three independent departments into the single Department of Biology.

It has truly been said of Ames: 'Seldom in the history of Harvard University has one man been called upon to fill so many important posts '*.

When Ames was still a very young man, he became deeply interested in the orchids. It was apparently through two steps that Ames entered into orchidology. One day, as a boy, he went into his father's room and noticed two flowers of *Dendrobium nobile* in a glass on a table at his father's bedside. These two lone flowers shed such a warm diffusion of colour on the otherwise dull scene that Ames was magnetized by their beauty. The second step—and the one which crystallized his resolution to devote his academic life to the orchids—was a conversation with Doctor N. L. Britton of the New York Botanical Garden. Sensing the young man's keen interest in the orchids and appreciating in him qualities of a sound taxonomist, Britton pointed out to Ames that the classification of the Orchidaceae was almost hopelessly confused and infantile. He put it to Ames that to make order of this chaos would need not only a brilliant taxonomist but extensive financial support. Finally, he suggested that since Ames had the interest, the ability and the wealth, he make the orchids his field. Ames took the suggestion and immediately began to amass material on a large scale. This decision 'has borne rich botanical fruit' for 'to-day, and in no small measure because of his work and that of his associates, the species of the Orchidaceae have probably been more thoroughly studied and more completely classified than those of any of the other larger plant families '*.

The large collection of living orchids which he had built up at his home at North Easton, where he also established the Ames Botanical Laboratory, led him deeper and deeper into an inquisitiveness about the classification, structure, and function of the orchids. Eventually, he donated this living collection to the New York Botanical Gardens, and gradually transferred most of the Ames Botanical Laboratory to the Harvard Botanical Museum in Cambridge, concentrating his major research efforts in the field of orchid taxonomy.

The Ames Orchid Herbarium, which now comprises 65,000 critically determined specimens as well as large numbers of line drawings, tracings, and photographs of type material from the large orchid herbaria of Europe, has become the largest single orchid herbarium in the world. No expense was spared in the building up of the collection, and Professor Ames went so far as to finance in part several expeditions to unexplored regions of the world in an attempt to perfect the representation of orchid material in his herbarium. Only the Lindley Herbarium at Kew and the Reichenbach Herbarium in Vienna

are comparable in scope; and the Ames Orchid Herbarium has become the centre for most of the taxonomic studies on the orchid flora of the Philippine area and of the New World. His herbarium is unique in having an extensive collection of critically determined floral dissections preserved on glass slides in small tin cabinets, an invaluable aid in rapid determination of new material and in monographic work. Professor Ames gathered together an unusually complete working library of orchid literature, including current journals, from all parts of the world; it forms an integral part of the herbarium. Both the herbarium and the library, now housed in the Botanical Museum in Cambridge, were given to Harvard University by Professor Ames in 1941.

In 1904 and 1905, Ames began to publish important taxonomic contributions in the orchid family and, in 1908, he agreed to write up the Orchidaceae for the 7th edition of *Gray's New Manual of Botany*. His interest and activity in this family soon widened, however, when, in the same period, he undertook the vast task of identifying the orchids of the Philippines, becoming eventually the leading authority on the family in that part of the world and describing hundreds of species new to science. It was early apparent to Ames that nothing could be accomplished without access to the type or classical collections which his European predecessors, Lindley, Reichenbach, and others, had accumulated and studied. Accordingly, in 1905, he left for a tour of study of important European orchid collections and, with his two assistants, Mr. R. G. Leavitt and Mr. A. A. Eaton, he visited Kew and the British Museum, the Musée d'Histoire Naturelle in Paris, and the Rijksherbarium in Leiden.

Ames's work on the orchids became even more extensive and gradually embraced many other parts of the world, especially Florida and the Caribbean area as well as Middle and South America. The collections of Ames and Eaton in Florida led to the publication early in his career of an article entitled *Additions to the Orchid Flora of Southern Florida*. This interest in the orchids of Florida, where Ames spent every winter, continued all through his life and was the basis of a number of papers and, very recently, of an extensive book. This book, entitled *Drawings of Florida Orchids*, he published jointly with Mrs. Ames who had done all of the illustrations throughout his years of research. His studies of the orchids of Middle and South America prompted him to make trips to Honduras and Brazil. In a little brochure entitled *Rediscovery of a Lost Orchid* he tells the story of his almost accidental finding of an orchid which had never been seen since the type collection.

Professor Ames was fortunate in having as his life-long companion Blanche Ames, an accomplished artist who illustrated all of his technical papers with extraordinarily artistic and accurate line drawings and etchings of the hundreds of new species. This close collaboration between Professor Ames and his wife is almost unique in the history of botany and has led to the publication of some of the most delightful works ever to appear.

In 1922, as soon as the Reichenbach Herbarium was opened after it had, in accordance with Reichenbach's will, been sealed from botanical eyes for twenty-five years, Ames and his wife visited Vienna for an exhaustive study of types in this collection. Mrs. Ames executed drawings and analytical sketches of most of the essential material in the Reichenbach and other herbaria for the Ames Orchid Herbarium. Of these two co-workers it has been said: 'Seldom in botanical history have science and art been so happily and fruitfully joined'.

For eighteen years, from 1905 to 1922, Ames, with his wife and sometimes with his collaborators, published a series of seven fascicles entitled *Orchidaceae: Illustrations and Studies of the Family Orchidaceae*. Included in these fascicles was a diversity of taxonomic studies comprising the descriptions of new species from the Philippines, British North Borneo, and tropical America, monographic work of North American genera such as *Habenaria*, *Pogonia*, and *Spiranthes*, and miscellaneous nomenclatural transfers. This series of fascicles gave way,

when research began greatly to increase the output of orchid studies, to a series of papers called *Schedulae Orchidianae* which, with the collaboration of Charles Schweinfurth, appeared in ten numbers, extending from 1922 to 1930. Ames, Hubbard, and Schweinfurth's *The Genus Epidendrum in North and Middle America*, published in 1938, will long remain a model of painstakingly exact taxonomic work.

In recent years Professor Ames's writings on the orchids, which have tended to be more philosophic than descriptive, have shown an astonishingly wide range of interest and a profound understanding of all aspects of orchidology especially the lore of orchidology in the medieval herbals. These papers cover a diversity of topics. He frequently contributed articles to the American Orchid Society Bulletin and wrote the *Enumeration of the Orchids of the United States and Canada* for the American Orchid Society.

Ames's bibliography, published in the Journ. Arnold Arboretum, 31, No. 4, 1950, numbers more than 300 papers or books on orchids, and in these he described more than 1000 species new to science.

Although Oakes Ames will undoubtedly be remembered primarily as the leading orchidologist of his day, he devoted much of his time and interest to economic botany and has so profoundly influenced thought and teaching in this broad field that he must be counted one of the outstanding economic botanists of this century. Accepting the broad definition of this discipline as a study of plants useful or harmful to man in their relation to human progress, he built up at Harvard something unique in biological research and teaching.

Ames's first contact with economic botany came during his association with Professor Goodale, his predecessor at the Botanical Museum, who had begun to assemble material and data for exhibits and teaching in economic botany. In 1909, Ames himself taught a course which he entitled 'Outlines of Economic Botany'. His serious interest in the subject took deep roots in 1914 and 1915 when Professor East invited him to offer a course in botany at the Bussey Institution of Applied Botany at Harvard.

As a graduate student, Ames was unable to understand the prejudice on the part of some of the leading taxonomists of the day against including cultivated or useful plants in the herbarium and their scorn of applied science. He began to accumulate his own herbarium of plants, wild and cultivated, upon which civilized and primitive man depends for his life. This herbarium, now housed in the Botanical Museum and known as the Economic Herbarium of Oakes Ames, has grown to include 18,000 specimens; it was given to the University in 1940. At the same time, Ames continued to increase the general collection started by Goodale, until, to-day, it is an enormous and enviable collection of plant parts, fibres, woods, extracts, and other products which are basic to teaching and research in the field.

Together with the herbarium and products collection, Ames accumulated a unique library of literature on useful plants. This library, now known as the Oakes Ames Library of Economic Botany, he loved to refer to as a 'gentleman's library'; it comprises approximately 16,000 volumes, pamphlets, theses, and reports and has, in addition, a newspaper clipping file. The library covers all aspects—botanical, anthropological, geographical, pharmacological, chemical, and agricultural—of useful plants, exclusive of ornamentals. It is most completely indexed as to author, subject (by vernacular and technical name), subject heading, and plates: the work of Ames himself and his associate, Mr. F. Tracy Hubbard. The economic herbarium and library were assembled at great expense of money, time and research, and together form a unit unexcelled for completeness in the world. With this extensive and unique background available to his students, Ames offered his course in economic botany, a course carried on and enlarged to-day by his successor, Professor Paul C. Mangelsdorf. This course, one of the most outstanding in Harvard College, has long been noted for its breadth of outlook and its interdisciplinary character. It was, in fact

only in economic botany that Ames taught, since no formal courses in the University were ever offered in orchidology. Besides this yearly course—taken eagerly by concentrators in biology, in pre-medical studies, and even in the classics—Ames gave a course in economic botany and carried out research in poison plants at the Harvard Medical School. Although Professor Ames might not have admitted it, he thoroughly enjoyed teaching. Using completely unorthodox methods (preferring to call his lectures 'chats') and utterly disregarding fact-cramming, he succeeded in quietly guiding his students into paths of original research which often led them to fields far removed from his own.

Ames's publications in the field of economic botany are few but outstanding. His book *Economic Annuals and Human Culture*, written in 1940, has taken its place as one of the most outstandingly original contributions to the whole philosophy of the inter-relationship between plants and man. Written in his clear and concise style, this book advances a number of novel ideas which have already begun deeply to affect anthropological and ethnobotanical thought. He set forth and developed the thesis that all civilization was dependent upon the angiosperm seed which gave man the chance to invent agriculture; that, later, the seed provided leisure time for him to develop arts and crafts; furthermore, that the annual habit of growth had made it possible for man to subdue plants to his will and to create great surpluses which increased the amount of leisure time available to him. He argued strongly and convincingly, on the basis of the evidence of the extreme advancement and specialization of our cultivated food annuals, for a far greater age for agriculture, especially in the Americas, than anthropologists were prone to allow. Ames lived to see the soundness of his thesis gain support by several extraordinary archaeological finds which have recently been made.

One of the greatest contributions to the teaching of economic botany, but one which, unfortunately, has never been published, is the so-called 'Ames Charts' upon which his course in economic botany at Harvard was based. These are charts showing in the form of a tree the phylogenetic relationships of the more important useful plants. Planned out by Professor Ames and beautifully executed in water-colour by Mrs. Ames, they have served to orient many a young man overwhelmed with the complexity of plant classification systems.

During World War I, Ames was drafted to serve on the Botanical Raw Products Committee of the National Research Council. One of the results of his activities for this Committee was the assembling of a large index of economic plants which to-day forms one of the bases of the Oakes Ames Library of Economic Botany. This index has served its purpose in helping to train economic botanists, and Professor Ames lived to see a number of the men he trained serve the United States Government during World War II as botanical consultants and technicians in the search for rubber, quinine, and other products essential to the war effort.

Although far afield from his own personal interests, palaeobotany also felt Ames's influence. It was largely through his own efforts that Mr. William C. Darrah came to Harvard and began research and teaching in palaeobotany.

An artist and perfectionist at heart, Professor Ames insisted almost fanatically upon the highest quality in paper, printing, and composition to set the highest of standards in scientific publications. He deplored the increasing cheapening of paper and printing in our modern scientific journals. Most of the earlier orchid work of Ames and his associates was privately printed by the best presses in New England. When he became Director of the Botanical Museum, however, Professor Ames decided that an institution as active in such diverse botanical endeavours as he planned to make the Museum needed its own journal. Accordingly, he founded the 'Botanical Museum Leaflets of Harvard University'. This review, issued irregularly in ten numbers to a volume, handsomely illustrated and printed artistically by hand-set type on high-grade paper, is now in its

fourteenth volume and is an outlet for research done by members of the Museum staff. He patterned it to cover a wide range of topics, including orchidology, economic botany, ethnobotany, genetical studies in economic plants, history of cultivated plants, general taxonomy, and palaeobotany. The Leaflets, as well as occasional books by members of the Museum staff, are published at the Museum on a press which Ames installed for this purpose.

In 1924, the Gold Medal of the American Orchid Society was awarded to Professor Ames for eminent service to orchidology, and five years later he was the recipient of the Centennial Medal of the Massachusetts Horticultural Society for his researches in orchidology. He earned the George Robert White Medal of Honour in 1935 for eminent services in horticulture. In 1938, he was awarded the honorary degree of Doctor of Science by Washington University.

Oakes Ames esteemed very highly his election on 7 December 1905, as Fellow of the Linnean Society of London. He was a member and vice-president (1923-1926) of the New England Botanical Club, an honorary member of the American Orchid Society and one of its vice-presidents from its inception in 1921 until his death, honorary vice-president of the Canal Zone Orchid Society, a member of the American Academy of Arts and Sciences and Sigma Xi, and Fellow of the American Association for the Advancement of Science. He belonged to many other learned societies.

Such a full scientific life did not create a one-sided man of Oakes Ames, for his extra-academic activities were diverse and demanding. During his university years, from 1895 to 1898, he served in the Light Artillery of the Massachusetts Volunteer Militia. He was long active as administrator of several large endowments and estates and was associated with a number of financial and business establishments. At school, he played baseball, and all during his life he followed professional baseball enthusiastically. A lover of fine music and literature, Ames amassed at his home a superb library and he spent much of his time in the study of the classics, Elizabethan English literature, and some modern writers of whom he particularly enjoyed Conrad and Tomlinson.

On 15 May 1900, Professor Ames married Blanche Ames of Lowell, Massachusetts, and six years later established their life-long home—'Borderland'—at North Easton. He is survived by Mrs. Ames and by four children.

Ames belonged to one of the oldest of those New England families to which the country owes so much. Born into a background of culture and wealth and deeply conscious of his family connexions, he seemed to feel that he was but a trustee of his rich heritage. Be that as it may, he turned the benefits of his heritage to the service of his fellow man through his chosen field of botanical endeavour. One of his colleagues has expressed this facet of Ames's life by saying: 'He never asked but was always giving.'

Ames has rightly been called a 'perfectionist'. His search for the best in all of his scientific endeavours is well known in botanical circles where the factual accuracy of his writings and the completeness of his plant descriptions is so well appreciated. His more philosophical writings sparkle with musical preciseness, and the most abstruse topics are treated with a delightful sprightliness which is often crowned with his whimsical humour. The constant striving towards perfection which early led him to choose the writings of Spenser as his model is seen in his most learned volumes and in his most casual letter.

Like so many other New Englanders, Ames was conservative in politics and liberal in religion. He found little or no conflict between his scientific and his religious philosophy; perhaps the two were one to him. He frequently told his students that they ought to approach their scientific careers with the humbleness which Tennyson expressed in his 'Flower in the crannied wall'; advice not often heard in these days of materialism.

RICHARD EVANS SCHULTES.