cates that entomophily had begun to exercise a marked influence on their evolution.

The development of a showy corolla, which has been thought might have arisen from a transformation of stamens such as we may still see in some double flowers, is associated with the entomophilous habit, and it is by no means unlikely that the development of a true corolla was preceded by a condition in which the stamens, otherwise unchanged, became colored, and thus attractive to insects visiting the flower for pollen or honey. Such a condition may still be found, for example, in *Eucalyptus* and *Acacia,* where a corolla is either quite wanting or is relatively inconspicuous.

There is no question that the extraordinary numbers and diversity of the angiosperms are in very large measure the result of their adaptation to cross-pollination through insect agency. The seeds of cross-fertilized flowers have been shown to be more numerous and the seedlings more vigorous than those from self-pollinated flowers. It is also a legitimate assumption that increased variability due to crossing is advantageous in tending to develop new characters which are subject to natural selection. While insects are the principal agents in cross fertilization, certain birds may also act in this capacity. In America the humming-birds are familiar examples. They seem to show a special preference for red flowers, like the scarlet sage, fuchsias and some of the pentstemons, *Zauschneria,* etc. In other parts of the world, *e.g.,* South Africa, the sun-birds play a similar rôle, and these, too, seem to have a penchant for bright red. The aloes and red-hot poker in our gardens are examples of old world ornithophilous flowers.

While we may hesitate to accept all the conclusions of the enthusiastic students who first realized the immense importance of entomophily, we have no reason to doubt that the course of evolution of the two largest groups of plants and animals, angiosperms and insects, has been powerfully influenced by the mutual adaptations that have arisen in the association of these two groups of organisms.

The great variety of fruits developed in the angiosperms and the correspondingly varied devices for the distribution of the seeds have also been important factors in their success.

The early history of the angiosperms is very obscure, and we have no satisfactory evidence of their existence prior to the Cretaceous. The general uniformity of their essential structures makes it pretty certain that they have all originated from some common stock—or at least from some assemblage of related forms from which a number of lines of true angiosperms diverged. The prevalent division into two coordinate subclasses, monocotyledons and dicotyledons, is probably a somewhat artificial one. It is more likely that from an undifferentiated widespread primitive stock, for which the name protangiosperms has been proposed, a number of lines of true angiosperms arose, some monocotyledons, others dicotyledons.

Once established, the angiospermous type showed itself to be remarkably adaptable, and it soon established itself as the dominant element in the land vegetation. Whence arose their extraordinary plasticity can only be conjectured. The type of fruit, with the complete protection of the seed until its maturity, may have been one of the important factors in establishing their superiority over the gymnosperms; but this will not explain the extremely plastic plant body which contrasts so strongly with the limitations of the gymnosperms.

It may be that cross-fertilization among angiosperms arose early in their history and that thus a greater degree of variability was induced, resulting in the appearance of many modifications which could be seized upon by natural selection and thus tend to develop new types. Whatever may have been the reasons, it is their extraordinary adaptability that is at the bottom of the remarkable success of the angiosperms. One important phase of this is the utilization of animals for the distribution of pollen and seeds. Nearly all plants whose organs have been modified with reference to animal structures are angiosperms, and the great variety of flowers and fruits is doubtless connected with such adaptations. However uncertain we may be as to their origin, the remarkable fitness of these plants to modern conditions is obvious, and they have largely monopolized the land areas of the whole world. Only under exceptionally favored conditions are the lower plant types able to hold their own in competition with the all-conquering angiosperms.

OBITUARY

RECENT DEATHS

DR. IRA NELSON HOLLIS, professor of engineering at Harvard University from 1913 to 1925 and president of the Worcester Polytechnic Institute from 1893 to 1913, died on August 15, at the age of seventy-four years.

DR. LOUIS MURBACH, for many years head of the department of biology in the Central High School,

Detroit, died on July 24, aged sixty-six years. Dr. Murbach had been instructor in zoology at the University of Michigan and at Woods Hole and is known for his work on invertebrate zoology.

WALTER DEANE, botanist and ornithologist, known for his work on the flora of northeastern North America, died on August 3. He was in his eighty-third year.

DR. ASA BARNES DAVIS, chief surgeon at Lying-in-Hospital, New York City, known for his work in obstetrics, gynecology and abdominal surgery, died on August 13. He was sixty-eight years old. Dr. Davis was one of the founders of the American College of Surgeons.

W. J. GREENSTREET, formerly headmaster of Marling School and for thirty-one years editor of the *Mathematical Gazette* of the British Mathematical Association, died on June 28 at the age of sixty-nine years.

DR. CORNELIO DOELTER, of Vienna, an expert in precious stones, died on August 12 at the age of eighty years. He was a professor of the University of Vienna, where he lectured on mineralogy and the chemistry of minerals.

MEMORIALS

FRIENDS and associates of the late William Stanley, inventor of the electrical transformer, gathered at Fairview Hospital, Great Barrington, on August 6 to dedicate to his memory an elaborately equipped X-ray room. Forty-four persons and corporations, including the General Electric and Westinghouse Companies, gave $35,000 to equip the room and endow it. Mr. Cummings C. Chesney, of Pittsfield, a vice-president of the General Electric Company, made the presentation address. Mr. Chesney and Frederick Darlington went to Great Barrington in 1888 as the two original assistants to Mr. Stanley in his early laboratory work there. T. Ellis Ramsdell, president of the Fairview Hospital Corporation, accepted the gift, which had been suggested by the late Ralph W. Pope. Mrs. William Stanley and four of six sons were present at the ceremony.

THE *British Medical Journal* writes: "The Osler Club celebrated, on July 12 at its headquarters in London, the eighty-first anniversary of the birthday of Sir William Osler. Professor Harvey Cushing, having been welcomed as a friend of the club and as orator, gave an informal address, full of the charm and the whimsicality of his subject. He told of the early Weston days, of Father Johnson and of James Bovell, and of how under their influence Osler turned from the church to medicine. Professor Cushing, in his address, revealed some of the secrets of the writing of 'The Life,' and much else besides, to the delight of his audience. Dr. Arnold Klebs took up the tale, to be followed by Sir Arthur Keith. Between the three, with occasional help from Sir D'Arcy Power, Dr. Henry S. Wellcome and Mr. Philip Franklin, a lively discussion continued, until Mr. W. R. Bett, foreign secretary of the club, remembered that it was long past Osler's bedtime, and with a graceful tribute to the orator and to the influence of 'The Life' upon the growing generations of medical men, brought the meeting to a happy conclusion. Before the oration the club entertained Professor Harvey Cushing to dinner at the Langham Hotel."

THE *Journal* of the American Medical Association reports that Professor Paul Krause, Münster, president of the Rheinisch-Westfälische-Röntgen Society, has announced a plan to erect a monument to Röntgen in the birthplace of Lennep. The plan is to raise one fourth of the cost of the monument or $2,500 from American röntgenologists. So far $900 has been raised and it is hoped that the remaining $1,600 will be contributed by 1,200 röntgenologists who have not yet responded. Contributions are to be sent to Dr. Otto Glasser, 2050 East Ninety-Third Street, Cleveland, Ohio.

THE offer of Professor S. Smiles and Professor A. J. Allmand to found a medal at the University of London to commemorate the services rendered to King's College and to chemical education by Professor John Millar Thomson, LL.D., F.R.S., has been accepted with thanks by the university. Professor Thomson first became a member of the staff of the department of chemistry at King's College in 1871, and retired in 1914, after having served for twenty-seven years as Daniell professor and head of the department of chemistry. The medal will be known as the John Millar Thomson Medal for Chemistry and will be awarded annually to the student of King's College who most distinguishes himself in the final year of the special honors course in the department of chemistry.

SCIENTIFIC EVENTS

THE FARADAY CENTENARY

THE following account is given by the London *Times* of arrangements being made by the Royal Institution for the celebration in September, 1931, of the discovery by Michael Faraday of electromagnetic induction, in which lies the origin of the dynamo and which is the starting point of the utilization of electric power for the purposes of man.