are available as the inheritors.[4] The political scientist and the sociologist have concerned themselves almost entirely with the problem of internecine strife as between human groups, but the biologist is convinced that a greater danger is involved. All that we do toward our own destruction weakens our position in our struggle with insects. The insects may not assume dominance, even though the present climate prevail and the food supply is sufficient, but we can hardly kill all the insects before we have killed all the people, even though we use insecticides much more lethal than DDT. Furthermore, we are not yet in a position to live without the insects and their allies.

Granted that insects thrive on our increased agriculture, that in spite of the gain in insect control our losses continue to increase with advance of agriculture[5]; granted that they act as hosts to many dangerous pathogens.[6, 7] We must not forget that insects are agents of pollination for many flowers, and hence are responsible for many fruits and vegetables; that, still more basic, insects and their allies play a vital rôle in the formation of soil. Hence we must live with insects in general, while attempting to control or eradicate those dangerous to our food economy and public health. This may not be done with mass flights of aeroplanes spouting insecticides, unless we wish to kill all the insects and take the consequences.

Instead, this problem of insect-control becomes an increasingly important phase of biology, of economic entomology utilizing powerful insecticides applied specifically. This implies a more enlightened insecticide-chemistry and an exact knowledge of the species ecology of many insects. It is a realm of exact research rather than of shotgun methods.

So insects in general must live while we kill people, and when, or if, enough people are killed, a point will be reached where insect control weakens, and we are no longer strongest. It should be about here that man begins to fall as a world power, to enter the dusk of biological extinction, from which no previous species has been known to make a complete recovery. The act of species suicide, of course, will have been committed long ago and may pass more or less unnoticed at the time. Even now it may have occurred, but I do not think so. From the point of view of an academic biologist, there is still time to preserve the species, but not very much time is available for ensuring its dominance in the long future.

OBITUARY

CARLTON C. CURTIS

DR. CARLTON CLARENCE CURTIS, for many years a professor of botany at Columbia University, died at his home in Tryon, N. C., on April 10, 1945. In his passing the science of botany lost one of its most erudite scholars and one of its most eminent teachers.

Carlton Curtis was born near Syracuse, N. Y., in 1864. He attended Syracuse University, from which he received the A.B. degree in 1889 and the Ph.D. degree in 1893. He also studied at Columbia University, earning his A.M. in 1892. Dr. Curtis continued his training abroad, spending one term at the University of Cambridge in England, where he was associated with Francis Darwin, and another at the University of Leipzig in Germany, where he came under the stimulating influence of the plant physiologist, Pfeffer.

Dr. Curtis served as principal of Fayetteville Union School, N. Y., for two years, and as an instructor in natural science in Brooklyn Polytechnic Institute for two years, but his real life work was at Columbia University, with which he was connected as a staff member from 1892 until his retirement in 1934.

His earlier research interests were in the growing science of plant physiology. Careful studies of turgidity in the mycelia of fungi under controlled and varying environmental conditions were followed by a number of investigations on transpiration. In the latter, the work performed in transpiration was computed, the activity of stomata at various times of the day was analyzed, and variations in the daily transpiration curve were recorded and interpreted. Even in these earlier years the breadth of the man was manifest, for in addition to this more intensive physiological work he published a series of researches on diverse topics: the early development of the lichen thallus; algae of New York harbor; successive flowering of the tulip tree in one season; the effect of feeble light in inducing characteristics of etiolation in plants; a discussion of the pines of the northwest. In each of these studies the author was concerned not merely with the accumulation of data, but with underlying causes and significance.

In addition to this research work, Professor Curtis wrote three books. The first, "A Textbook of General Botany," was published in 1897; the second, "Nature and Development of Plants," appeared in 1907, and subsequently went through a large number of editions and printings. It had wide acceptance

[4] L. O. Howard, "The Insect Menace." Century Co. 1931.

[5] *Idem*, "The Needs of the World as to Entomology." *Ann. Ent. Soc. Am.*, 18, 1925.

[6] W. A. Riley and O. A. Johannsen, "Medical Entomology." New York: McGraw-Hill. 1938.

[7] W. B. Herms, "Medical Entomology." New York: Macmillan. 1939.

for use in general courses in universities and colleges throughout the United States, and was one of the first modern text-books of botany. Unlike the vast majority of scientific text-books, it had a distinctive style and literary merit; in addition, it was a masterly presentation of the whole field of botany. His third book, "A Guide to the Trees," was first published in 1925; it also has gone through numerous printings and has been very extensively used. It was intended as a scientifically accurate guide to the trees of northeastern North America, written in language that an intelligent person without specialized training could understand, and it has served its purpose well. The illustrations were made by Mrs. Curtis. In this book Dr. Curtis demonstrated that, although he was originally a plant physiologist, he could write authoritatively and effectively on the flora of eastern North America. The teaching herbarium of Columbia University, which he assembled largely with his own hands, is further testimony to his taxonomic ability.

Although Professor Curtis attained eminence as a scientist and as an author, his outstanding achievement was his supreme competence as a teacher. He taught the large general course in elementary botany through his long years of service at Columbia University; he gave graduate work in plant morphology; he offered a course on trees and timbers to engineering students, and another on algae in Columbia College. Dr. Curtis was an inspiring teacher, partly because of his very wide training in his chosen field, partly because of his unusual command of English and partly because he combined a forceful and engaging personality with a sympathetic understanding of human nature.

In his earlier life Dr. Curtis was a man of buoyant disposition and genial manner, sparked by a keen sense of humor. In his later years he was still the witty, animated, gifted conversationalist, with an almost endless fund of true stories, based largely on his own experiences. He had traveled widely, had been very fond of camping, fishing and hunting, and had spent most of his spare hours a little beyond the end of the trail. He kept records of plants and birds in the field, of their adaptations and their habits. With his many years of careful observation and training, he was an accomplished naturalist with a deep understanding and appreciation of plant and animal life.

Dr. Curtis, furthermore, was a sensitive, poetic, innately religious man, "old-fashioned" in his convictions of right and wrong and completely and forcefully outspoken in his defense of the right, regardless of the consequences. Such men do not carry on in an imperfect world without considerable internal suffering.

Fortunately he spent more than a decade in idyllic retirement; his wife, Ellison Gwyn Curtis, shared with him his philosophy, his love of good literature, his interest in plants and birds and his fondness for camping and fishing.

His was the consummate satisfaction of a long and fruitful life, well lived; his is the enduring memorial which a real teacher cherishes—to be enshrined in the hearts of his students as one who quickened the mind and passed on the light. Professor Curtis was in truth a man with a soul.

EDWIN B. MATZKE

COLUMBIA UNIVERSITY

DEATHS AND MEMORIALS

THE following messages in regard to the death on October 1 of Dr. Walter B. Cannon, emeritus professor of physiology of the Harvard Medical School, have been addressed to the president of the National Academy of Sciences and to its officers:

The Academy of Sciences of USSR deeply mourns the untimely death of its honorary member Walter Cannon and begs you to transmit to American scientists the sincerest condolences of Soviet scientists.

SERGHEI VAVILOV, *President,*
Academy of Sciences of USSR

On behalf of Royal Society London we join you in sorrow for death of your Foreign Secretary and our Foreign Member Walter Cannon and pay tribute to his work for international community of science.

DALE, *President*
TIZARD, *Foreign Secretary*

WILLIAM ELTON MOTT, director, retired, of the College of Engineering of the Carnegie Institute of Technology, died on October 5 at the age of seventy-seven years.

WILBUR J. SUMPSTINE, assistant professor of biology at Bethany College, died on September 30 at the age of forty-one years.

DR. GEORGE HENRY ROBINSON, since 1924 bacteriologist and immunologist to the Wm. H. Singer Research Laboratory of the Allegheny General Hospital, Pittsburgh, died on September 29 at the age of fifty-six years.

TRIBUTES were paid this month by the Michigan College of Mining and Technology at a college assembly, over the radio, and before civic groups, to the memory of Dr. Douglass Houghton, first state geologist of Michigan and versatile pioneer in many fields of endeavor. October 13, 1945, was the hundredth anniversary of Dr. Houghton's death. He was drowned in Lake Superior, off Eagle River, while engaged in a geological, mineralogical, topographical and magnetic survey of the Upper Peninsula of Michigan.