I have outlined the differentials found in South Florida south of 27°30′ north in my book, "The Vegetation of South Florida" (1914). On the east coast of Florida are rolling sand plains and sand hills which extend from the north side of Indian River Inlet south to Hillsboro Inlet. It appears that these sand hills are ancient dunes formed by wind action, for the sand deposits have covered an older, flat land of limestone. These hills are covered with the sand-pine or spruce pine (*Pinus clausa*), with low oaks (*Quercus geminata, Q. minima, Q. myrtifolia*), the saw palmetto (*Serenoa serrulata*) and rosemary (*Ceratiola ericoides*) and other plants.

To the southward are exposures of oolithic limestone which are covered with slash-pine (*Pinus caribaea*) and an occasional silver thatch-palm (*Coccothrinax argentea*) and coontie (*Zamia integrifolia*). Around Princeton there are depressions in the limestone where broad-leaved hammock plants grow as islands in a sea of pines. Below Miami are everglade prairies which cut the slash-pine forest transversely. The delimitation of pineland and prairie is here very sharp. One can stand with one foot on the prairie and the other in the pine forest. The difference in elevation between pineland and prairie is only about a foot or eighteen inches. Back of the pineland occurs the fresh-water marsh, or fenland known as the Everglades. Here is a sea of saw-grass stretching unbrokenly to the horizon in every direction, the surface diversified by hammocks and groves of trees. The whole fen is threaded by channels which connect open lagoons filled with aquatic plants. Lake Okeechobee is a sufficiently large body of water to ameliorate the climatic of the south shore, for here we find a forest of custard apple (*Annona glabra*), a mile or two wide, bordering the south shore of the lake.

Stretching south and southwest from the extreme end of Florida there is an archipelago of approximately two hundred named islands known as the Florida Keys. First at the northeastern end of the chain are two sand islands, namely, Virginia Key and Key Biscayne, designated the Upper Sand Keys. Seven miles south of Key Biscayne is a second group of islands composed of coral rock extending from Soldier Key a distance of approximately one hundred and twenty miles to the West Summerland, or Spanish Harbor Keys. This section of the chain may be called the Upper Keys. Beginning with No Name Key and Little Pine Key is the third natural group extending in a western direction for thirty miles to Key West. The islands of this group are composed of Miami limestone and are known as Lower Keys. Westward of Key West reaching into the Gulf of Mexico lies the fourth section of the Florida Keys, composed of sand. These are the Lower Sand Keys. As one might expect these differences in the character of the materials composing the islands of the four groups of Florida Keys naturally influence the character of the vegetation. We find that to be the case, for the Upper Sand Keys maintain a sand-dune and hammock flora related to that of the coastal peninsula to the north. The Upper Keys are clothed with a dense hammock growth of tropical hardwood shrubs, trees and palms, resembling the vegetation of the Bahama Islands. The Lower Keys are more varied in their vegetation with large areas covered with pineland, palm groves and extensive hammocks.[8] Their vegetation suggests that of Cuba. The Lower Sand Keys are little more than bars of sand, shifting their position with the ocean currents and with the hurricanes that sometimes strike them so as to completely change their entire configuration. Dr. William R. Taylor informs me that a tropical hurricane may denude completely the coastal fauna and algal flora of these islands. The Lower Sand Keys support usually, like the ocean side of all the Florida Keys, the characteristic strand flora found on most of the West Indies.

The foregoing sketch indicates that from north to south, excluding the climate from consideration, the edaphic, geologic and physiographic differences are productive of differences in the flora, and if we consider the matter from the ecologic and phytogeographic aspects, these differentials are directly responsible for variations in the vegetation or ensemble of plant species as related to environment. Such a survey shows that there are many problems awaiting study, and the Atlantic coastal plain is favorably situated for such research, for many large cities are situated along its inner edge known as the "fall line" and the student can use these centers of population as providing the facilities for his investigation.

JOHN W. HARSHBERGER

BURT GREEN WILDER

DR. BURT GREEN WILDER, professor of neurology and vertebrate zoology, emeritus, in Cornell University, died at his home, 93 Waban Hill Road, Chestnut Hill, Mass., on January 20, 1925, in his eighty-fourth year.

Dr. Wilder was born in Boston on August 11, 1841, and traced his ancestry directly back to Thomas Wilder, one of the *Mayflower* passengers. His youth and early manhood were passed in the stimulating intellectual, moral and political atmosphere of New England; and he enjoyed the instruction and friendship of the great teachers Asa Gray, Oliver Wendell Holmes, Jeffries Wyman and Louis Agassiz. His well-known uprightness of character, his devotion to

[8] Small, John K., "Flora of the Florida Keys," New York, 1913.

what he believed to be right proved him to be a worthy product of these influences.

His preparation for college was made in the high school of Brookline, Mass. In 1862 he graduated from the Lawrence Scientific School (Harvard) with the degree of B.S. *in anatomia summa cum laude;* and in 1866 he received the degree of M.D. from the Harvard Medical School. After graduation from the Lawrence Scientific School in 1862, he entered the U. S. Army and served for three years in the 55th Massachusetts Infantry (colored), first as medical cadet, later as assistant surgeon and finally as surgeon. During this period, while stationed near Charleston, S. C., he began his investigation of the possibility of utilizing the silk of the silk spider (*Nephila clavipes*), the results of which he published later. He also published, later, accounts of the habits of several spiders, among which was the remarkable triangle spider (*Hyptiotes cavatus*). From 1866 to 1868 he was assistant in comparative anatomy in the Museum of Comparative Zoology, working under the direction of Louis Agassiz. He was also curator of herpetology in the Boston Society of Natural History.

In 1868 Dr. Wilder became a member of the first faculty of Cornell University as professor of comparative anatomy and zoology, having been recommended to President White for this position by Louis Agassiz and Asa Gray. In 1910 he retired from active service in the university after having been a leading member of its faculty for forty-two years. During this period there were several changes in the title of his department and in the scope of its work, due to the establishment of new departments to care for certain specialized divisions of the field. It was a marked characteristic of Dr. Wilder that as the university grew and as the young men associated with him became competent, he favored placing them in charge of separate departments, with apparently no thought that the restricting of his field lessened his own importance. During the later years of his service he was professor of neurology and vertebrate zoology.

In 1866 he delivered the Lowell Institute lectures in Boston. He was lecturer on comparative anatomy in the Anderson Summer School of Natural History which was conducted by Louis Agassiz at Penikese, 1873–74, and lecturer on physiology in the Medical School of Maine, 1875–84 and in the University of Michigan, 1876.

Dr. Wilder was a remarkably inspiring teacher. He was a brilliant lecturer. His lectures were expressed in faultless language and were filled with enthusiasm for his subject; this inspired his hearers to feel that the subject discussed was of supreme importance. He was fertile in devising experiments to illustrate his lectures, and made use of many anatomical preparations for this purpose.

He was an ardent believer in the importance of laboratory work, and from the first he encouraged the students to take it. Later he became convinced that a certain amount of such work should form an integral part of every general course in natural science; so that even with classes numbering two hundred, a third of the time was given to the practical exercises, or "practicums" as he termed them. The accumulating and preparation of the specimens required for this involved much labor and considerable expense, but was cheerfully done. This began in 1880–81 in zoology, and in 1886–87 in physiology. At that time this was a new feature in the teaching of large general classes, but it has since become quite generally adopted.

For many years Dr. Wilder had no private laboratory, but pursued his investigations at a table in the general laboratory, where he was a constant inspiration to the students working there. The writer recalls vividly with what enthusiasm he used to call us about him in order to point out some step in advance in the research he was making. One can imagine nothing more stimulating to the young student than experiences of this kind.

Dr. Wilder was in the habit of urging his students to strive in composition for *clearness, consistency, correctness, conciseness* and *completeness.* These he called his five C's. He always placed clearness first. He said on one occasion: "It does not make any difference whether what you say is true or not, if it is clear."

He was a very humane man; nothing would arouse his wrath more quickly than to see a dumb animal mistreated. At his home or laboratory there was always one or more pets which he cherished.

The number of students who were taught by Professor Wilder is very large. For nearly thirty years, at the wish of President White, who laid great stress upon an elementary knowledge of physiology by all students, he delivered a course of lectures on the principles of physiology and hygiene, which were attended by all freshmen. At the same time many students were enrolled in the more special courses.

As an evidence of the high regard in which Dr. Wilder was held by his former pupils, some of them upon his completion of a quarter of a century of service in the university prepared and published a volume of original contributions to science, "as a testimonial of their appreciation of his unselfish devotion to the university and in grateful remembrance of the inspiration of his teaching and example."

This volume was entitled "The Wilder Quarter-Century Book" and included original contributions to science from fifteen of his former pupils. This, so far as is known to the writer, was the first American adoption of the German plan of honoring a beloved professor by the publication of a *Festschrift.*

The results in teaching and in research accomplished

by Dr. Wilder during the early years of the university illustrate what can be done by an earnest man in spite of lack of facilities now regarded as essential. He had no assistance except from students; but little apparatus, for a long time there was not a single microscope in the laboratory and then but one which was rented; a departmental stenographer was unthought of in those days. It was under these conditions that many men now widely known for their contributions to science received their early training and under which Dr. Wilder published many papers.

In the earlier years Dr. Wilder devoted his attention to various zoological problems; but later he gave most of his time to a study of the morphology of the brain, and to a simplified terminology of the parts of the brain. He prepared nearly two thousand vertebrate brains, many of which are human, including thirteen from educated persons. This collection is now at Cornell University. In 1867 he devised the "slip-system of notes," the use of which has become universal.

His published works include "What Young People Should Know," 1874; "Anatomical Technology" (with S. H. Gage), 1882; "Physiology Practicums," "Emergencies," 1883; "Health Notes for Students," 1890; "The Brain of the Sheep," 1903, numerous reviews and articles in magazines and in the "Reference Handbook of Medical Sciences" and several musical compositions.

After his retirement from Cornell he lived at Chestnut Hill, Mass., and at his summer place at Siasconset, Mass., and devoted himself to the preparation of his autobiography and to a history of the regiment with which he served during the Civil War, the 55th Massachusetts Infantry. He was engaged all day upon this work the day before he died.

Dr. Wilder was twice married. His first wife, Sarah Cowell Nichols, to whom he was married in 1868, died in 1904. His second wife, Mary Field, died in 1922. Two daughters survive. They are Mrs. Shepard Stevens, wife of a Yale professor, and Mrs. Robert R. Reed, of Washington, Pa.

J. H. COMSTOCK

CORNELL UNIVERSITY

SCIENTIFIC EVENTS

CLÉMENT ADER AND THE AEROPLANE[1]

M. CLÉMENT ADER, one of the pioneers of aviation, has died at Toulouse, at the age of 84. It is claimed in France that he was the first man to fly in a power-driven aeroplane, and he had come to be regarded in France as "the father of aviation."

An electrical engineer by training and engaged in the government service in the Department of Ponts-et-Chaussées, M. Ader devoted himself passionately to the study of flight from a very early age. One of his first efforts was a man-lifting kite. He had a large bird cage built in his garden at Passy in order to observe the flight of birds.

In 1886 he began to build a flying machine, and after four years' hard work brought it to completion. It was called the "Eole." His enterprise attracted some attention, but the trials were held in great secrecy, and the public was not quite sure whether the "Eole" had flown the few feet which were claimed for it or not. A second model was built a year later, but was wrecked while being tried at Satory. However, the government had become interested in his work and placed funds at his disposal for a fresh attempt.

Eventually, on October 14, 1897, a third machine, known as the "Avion," built by M. Ader, flew, it is claimed, though the question will ever remain in doubt, about 300 yards in the presence of representatives of the Ministry of War. It was a curious structure, with folding bat-like wings and twin screw propellers driven by a steam engine. M. Ader placed his plans at the service of the government, but his machine did not inspire sufficient confidence, and his offer was refused. This was a bitter blow to him. He had had to face ridicule and incredulity enough during his unsuccessful attempts, but to be discredited after half a lifetime's work had been crowned with moderate success was more than he could bear. He gave up his research work, burned his plans, and went into retirement in his native village of Muret, in the Haute-Garonne.

As flight progressed the value of Ader's experimental work was recognized, and he has long been given his proper place in the history of aviation. Last summer he was made a Commander of the Legion of Honor; a monument is to be erected at Satory on the spot where he made his flights, and the original machine is preserved in the Musée des Arts et Métiers.

All French military aircraft are now officially referred to as *avions* as a generic term for heavier-than-air machines of all types. The name was chosen in recognition of M. Ader's services to aviation.

[1] From the London *Times*.

CAPTAIN AMUNDSEN'S PROPOSED FLIGHT TO THE NORTH POLE

CAPTAIN ROALD AMUNDSEN has sent a message to the London *Times* from King's Bay, Spitzbergen, under date of May 1, as follows:

When this article appears in print, and if everything continues to develop in accordance with our plans, the trial flights will be over, and the start may take place any day. Up to the present everything has conformed to