There are thus two opposing forces acting on the anemometer, the one due to the motion of the ions and the other due to the transfer of heat from the centers outward. The direction of rotation depends upon which of these forces is in excess. No attempt has yet been made at quantitative measurements, although such measurements could probably be made by a torsional suspension of the anemometer in a vessel as large as that described in experiment 10.

It is my hope in the near future to investigate a possible difference of potential between the walls and the center of the vessel, and also to study the motion of the cathode rays in a Tesla field.

In addition to furnishing direct support to the Maxwell equation, the experiments may be of some value from their bearing on the electron theory of electricity. The electrodeless discharge consists of a rapidly alternating current of electricity similar to that which would be produced in a metal ring placed within the coil. It thus appears that such current is at least accompanied by ionic motion even if such motion does not constitute the current itself.

Bergen Davis.

Göttingen, February 17, 1902.

*THE TROPICAL LABORATORY AT MIAMI, FLORIDA.**

The extent to which the government of the United States is making provision for scientific investigation in connection with the work of its various departments, notably that of the Bureau of Plant Industry, is a matter of congratulation. To scientific workers especially, it is a gratifying fact that the laboratories established primarily for the study of plant diseases and other subjects of a practical nature are being thrown open to investigators of widely different aims, their facilities being freely placed at the disposal of students engaged in any line of research whatever. One of these, the Tropical Laboratory of the United States Department of Agriculture, has been established so recently and offers such exceptional advantages that its location and facilities should be widely known. This laboratory, located at Miami, Fla., in 1899, was formally established under its present name in 1902. After the discouraging failure of much of the experimental work at Eustis, Fla., occasioned by the disastrous freezes of 1894–95, it became apparent that another place must be selected less subject to climatic vicissitudes, and thus far there is every reason to believe that the location now chosen will admirably fulfil the requirements for such a station.

Miami is situated a little south of the twenty-sixth parallel of latitude, in direct communication with the north by rail, and with Nassau, Havana, and Key West by the Peninsular and Occidental Steamship Line. The city, only a few miles from the Everglades, is healthfully built on the coral breccia which forms the underlying rock, and looks out on Biscayne Bay, landlocked by the northeastern extension of the Florida Keys. Its delightful climate, permitting all sorts of outdoor study and exploration in midwinter, is not the least of its many advantages. The laboratory, situated a mile south of town, is easily reached in ten minutes by wheel over a smooth rock road. Six acres of land belong to the station, upon which experiments in acclimatization and plant breeding are in progress. The laboratory building is a plain but substantial and well-arranged structure, with office and library in which are shelved upwards of two thousand volumes, including pamphlets and periodicals, among which are the *Botanisches Centralblatt, Botanischer Jahresbericht,* Science, the *Botanical Gazette* and other current

* Read before the Michigan Academy of Science, March 27, 1902.

literature, largely botanical and horticultural. The director's private laboratory is equipped for chemical, microscopical and bacteriological work, and a similarly situated room is fitted up for the laboratory assistant. A well-lighted room with tables, sink, gas connections and other conveniences is reserved for the use of investigators, and during the past year several representatives of northern universities have availed themselves of the privileges thus offered. The director, Professor P. H. Rolfs, has extended every possible courtesy to myself and others, and has made the conditions for work well-nigh ideal. Although his time is very fully occupied with investigations and experimental work, it is his expressed wish, in accordance with the liberal policy of the Bureau of Plant Industry, that qualified investigators should avail themselves freely of the privileges of the laboratory.

The work now in progress at the Tropical Laboratory includes a continuation of experiments interrupted at Eustis, and many others which cannot be described here. The production of hybrid oranges with a view to obtaining a variety that is hardy and at the same time possessed of other desirable qualities, the breeding of refined strains of the pineapple, acclimatization of promising varieties of mango and other fruits, the adaptation of Peruvian corn to Florida lands, and experimental cultivation of forage plants, grains, and other plants of economical value from all parts of the globe, constitute a portion of the work undertaken, no small part of which has reached a point at which a successful issue may be hopefully anticipated.

Recurring to the opportunities offered to students of biological problems, more particularly those in which botanists are interested, there are certain lines of work specially favorable for extended study, largely on account of the great wealth of material always close at hand. One of these involves further investigation of climatic influences in determining both the range and habits of plant species. The whole matter of acclimatization and the limits within which given varieties are capable of normal development is of such obvious economical importance that it has become, as already noted, a leading subject of investigation on the part of the Bureau of Plant Industry, but the habits and structures of native species, in evident adaptation to rainfall and other factors, though so striking as to attract the attention of every intelligent observer, have been very inadequately studied. The great preponderance, in southern Florida, of one particular mode of adaptation to xerophytic conditions and the partial adoption of this form by species not yet fully adapted to their surroundings suggest one of the many fruitful lines of study that are offered here under most favorable conditions. Equally important, and doubtless quite as promising, is a study of soil conditions, which here plainly exert a marked and even determining influence on the vegetation of particular areas. So apparently simple a matter as a demonstration of the origin of the 'hammocks' has not yet been accomplished. Their interesting and obvious resemblance to islands, as pointed out by some writers, is highly suggestive, but gives no account of their actual history.

The investigation of these and similar questions will naturally be accompanied by a more extended comparison than has yet been made of specific and representative forms common to southern Florida on one hand and the West Indies and more northern regions on the other. Such a comparison should involve much more than a mere enumeration of common species. Differences of form and habit, requiring for their observation some degree of expert knowledge, must be noted where the plants are

growing, since in many cases herbarium material is entirely inadequate for the purpose.

Without attempting further enumeration or suggestion, it may be said in brief that for the study of tropical and semitropical plants, both native and introduced, the investigation of habit and structure as adaptations to both climatic and edaphic factors, and the demonstration of various existing facts of plant distribution as a phase of geological history now in progress, the Tropical Laboratory at Miami offers advantages that can hardly fail to attract and reward earnest students for years to come.

V. M. Spalding.

Miami, Fla.,
February 27, 1902.

HENRY MORTON.

The death, in New York city, May 9, of Dr. Henry Morton, President of the Stevens Institute of Technology, removes from the stage one who cannot be replaced either in the field of his work or in the hearts of his friends. Nor can his work be fully appreciated by any one man or by any one class of men, so varied has it been in character, in its fields of action and in its specialization.

Physicist and engineer; chemist and educator; investigator and legal expert; linguist, editor and writer; man of business and philanthropist; pioneer in the reduction of the art of the mechanic and inventor to a professional and scientific form; mechanic, inventor and organizer and administrator: his many-sidedness necessarily precludes alike appreciation, correct judgment and exact quantitative measurement of his life's work. Whoever studies the life of the man and endeavors to weigh his work and its productive value to the world will at least conclude the investigation impressed with the conviction that this was the rarest of rare cases, that of the man of genius, at once brilliant and versatile, and fruitful of good works in many departments ordinarily supposed to be far separated, as vocations, by the constitution of the human mind. But heredity, environment and an irrepressible ambition conspired with extraordinary powers to make this life fruitful, both in opportunity and in accomplishment.

Henry Morton was born in New York city, December 11, 1836, the son of the late Rev. Henry J. Morton, Rector of St. James' Church, Philadelphia, and the grandson of Col. James Morton, a patriot of the Revolution, inheriting strength and talent from earlier generations of well-known families. He was educated at the University of Pennsylvania.

While still an undergraduate he undertook with classmates the translation of the parallel texts of the famous Rosetta Stone. Mr. C. R. Hale translated the Greek and the Demotic texts and Morton the hieroglyphics. Young Morton also made the smooth manuscript and illuminated it with a skill and taste which proved his inheritance from his father of remarkable artistic ability. This work was published at the suggestion of Henry D. Gilpin, later U. S. Attorney-General, and was edited by Morton, who actually reproduced the manuscript on the lithographic stone and all its illustrations. The extraordinary task was completed and the book issued from the press in the latter part of the year 1858, a volume of 172 pages with 100 illustrations. The book remains one of the famous and rare works in its department. It was commended in enthusiastic terms by Baron Humboldt.

On leaving college, Morton delivered the valedictory address and in admirable verse. His talent as poet continually came to the surface, even in later years and in the midst of the most engrossing occupations.