hend he must be taught to think in terms of hydrogen ion concentrations. The use of pH is like the use of degrees Beaumé. Specialized industries like to develop their special jargon. It makes numerical details easier to remember and it makes the outsider feel more ignorant. It is all right to use pH if you know what it means. Likewise, one might say for the benefit of our friends in the allied sciences that it is all right to use a hydrogen electrode if you know what you are doing.

There remain only two or three topics to mention. The phase rule is apparently becoming relatively less important in theoretical chemistry. Of rates of reaction and the mass law in solutions we shall have to speak softly. But equilibrium and rate of reaction in the gaseous phase has become of greater interest than ever from recent experimental work, and the student is not likely to get too much of them.

In this paper it is hardly necessary to mention thermodynamics, the faithful handmaiden of physical chemistry. Twenty years ago, we had many branches of exact science, mechanics, electrodynamics, etc. The wave of heresy known as the quantum theory came. Perhaps it will pass. At any rate, to-day the only branch of physical science in which we put an unfaltering trust is thermodynamics.

The early chemists started to develop the idea of chemical affinity. Then they met with the phenomenon of chemical equilibrium and they abandoned the affinity idea in favor of the law of mass action. But each view is partially right. Atomic structure tells us of chemical affinity; statistical mechanics predicts the effect of thermal energy; what happens to matter is the resultant of the action of these two agents. Apparently the theoretical chemistry of the future will consist almost entirely of these two subjects.

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THE HARVARD BOTANICAL GARDEN IN CUBA

A TROPICAL STATION FOR GENERAL BIOLOGICAL RESEARCH

SOME twenty years ago, Mr. E. F. Atkins set aside a portion of his estate at Soledad near Cienfuegos, Cuba, for development into a tropical botanical garden, with special facilities for plant breeding. At an early date Mr. Atkins secured the cooperation of the late Professor George L. Goodale and of Professor Oakes Ames to help carry out his plans, and since this time the work has progressed continuously.

Mr. R. M. Grey, the superintendent during this period, has been indefatigable. A collection of nearly two thousand species of tropical plants has been brought together from various parts of the world, including particularly fine aggregations of palms and of tropical fruits. All the important fruits of the tropics are now represented, the varieties of mangos, of citrus fruits and of avocados being especially extensive. In addition, a great many crosses have been raised and tested on a large scale. Mr. Grey has been particularly interested in sugar cane breeding, and his work on this crop has been second to none in the Americas, but his work on citrus fruits, cotton, mangos and guavas is also worthy of mention.

From these statements, it will be seen that the Harvard Botanical Garden in Cuba has long been a going concern, with exceptional facilities for tropical research in botany. Unfortunately, the garden has not been able hitherto to accomplish the purpose for which it was designed by its founder, because of the lack of laboratory and of living quarters.

Through the generosity of Mr. Atkins, this difficulty has now been removed, and it is the hope of both the founder and the corporation of Harvard University that the garden will become one of the centers of tropical research in America. There is a substantial endowment for work, and a handsome brick and stucco building which is to serve both as laboratory and living quarters for investigators.

LOCATION OF THE GARDEN

The Harvard Botanical Garden is on the southern side of Cuba six miles from Cienfuegos and may be reached by rail from Havana in about nine hours. The land on which it is situated is the rolling plain typical of the sugar estates of Santa Clara province. The garden itself is well watered and furnishes soils of several types upon which almost every sub-tropical plant can be grown to advantage. Near the garden is a second-growth jungle of several acres. Twenty miles to the east lie the Trinidad Mountains rising over 2,000 feet from the surrounding plain, partly untouched by the cultivator and partly planted to coffee. To the south, reached in one hour by boat from Soledad, is Cienfuegos Bay, one of the wonder harbors of the world.

FACILITIES FOR INVESTIGATION

The Harvard Botanical Garden in Cuba will be of primary interest to the botanist, but it is really a general biological institution offering extraordinary opportunities to the zoologist and physiologist.

To those interested in land plants and animals, the garden itself will be an inexhaustible source of material. The plant pathologist, the plant breeder, the physiologist and the entomologist need never lack interesting and important problems. The taxonomist, be he zoologist or botanist, will be long in exhausting the possibilties of the surrounding country.

Those wishing to investigate marine forms have only to take a short trip down the Caunau River to the Milpa on the inner neck of Cienfuegos Bay where they can be accommodated at Mr. Atkins's commodious summer place.

EXPENSES

Rates from New York to Cuba by water are very low, and those accepted as resident investigators will be under merely nominal expenses while working at the garden.

Those who desire to apply for a table should state what problem they wish to undertake and when they expect to be in residence. For further information address Professor W. M. Wheeler, dean, or Professor I. W. Bailey, secretary, The Bussey Institution of Harvard University, Boston 30, Mass.

E. M. EAST

BUSSEY INSTITUTION,
HARVARD UNIVERSITY

SCIENTIFIC EVENTS

IMMUNIZATION AGAINST PNEUMONIA

THE Influenza Commission of the Metropolitan Life Insurance Company announces the discovery of a new treatment for pneumonia which holds out the definite hope of accomplishing a radical reduction in the death rate of this disease, so often a sequel to influenza.

Dr. Lloyd D. Felton, assistant professor of preventive medicine and hygiene in the Harvard Medical School, working in the department of preventive medicine and hygiene, has found a method of precipitating and concentrating the antibodies in anti-pneumococcus serum. The concentrated antibody solution has been used with encouraging results in about sixty cases at the Boston City Hospital and in about sixty more in hospitals in New York and Brooklyn. Dr. Felton read a paper before the New England Health Institute in New York City on May 9 making public the methods and essential facts.

Dr. Felton's studies have dealt with the virulence of pneumococci, the pneumonia germs. He has sought to isolate the protective element in the serum taken from a horse immunized against pneumococci. The serum itself is weak and produces violent reactions in the form of chills, serum sickness, rashes, etc., which have radically diminished its value for the use of private practitioners.

While making studies with carbon dioxide precipitant, Dr. Felton observed that a very heavy precipitate was formed in the serum when diluted in plain water. Convinced that the substance carried with it the protective element of the serum and left behind the harmful substances, he tested it out with mice. He injected virulent pneumococci into a group of mice. After six hours he injected the new serum into some of the mice, while he allowed the disease to run its course with the others. At the end of thirty-six hours the controls had died of pneumonia. The mice protected by the serum recovered.

After further refinements of the serum, Dr. Felton distributed his product to a group of clinicians in hospitals in Boston, New York and Brooklyn, to be used for the benefit of those suffering from pneumonia. The encouraging results include the fact that the serum sickness and other harmful reactions have been practically eliminated.

The injections in human treatment are made intravenously. Subcutaneous injections, tried recently by scientists in the hope of escaping the harmful reactions of the old serum, were found to have little protective power. Dr. Felton's preliminary tests with other than Type I pneumonia indicate that it will not be difficult to have the same success with the other types of lobar pneumonia.

Added importance is given to the work by the probability that the isolation of the protective substance in pneumonia serum has brought to light a general law concerning the action of protective antibodies. "In addition to pneumococci, as a matter of control," Dr. Felton states, "it has been found possible to isolate the protective substance in immune sera developed by other micro-organisms. There are indications that the protective antibody of the pneumococcus is one of many which act in a similar fashion, and its behavior represents a general law for certain groups of bacteria."

Dr. Felton worked in the laboratory of Dr. Milton J. Rosenau, professor of preventive medicine and hygiene in the Harvard Medical School and chairman of the Influenza Commission of the Metropolitan Life Insurance Company. He went to Harvard in the fall of 1922 where he has been steadily at work on the mechanism of virulence. He is a graduate of Wooster College, Ohio, A.B., '10, and of the Johns Hopkins Medical School in 1916.

EXPEDITION TO THE VALLEY OF THE AMAZON

DR. CARL D. LARUE, of the department of botany of the University of Michigan, landed in New Orleans on March 14, after spending over eight months in different parts of the valley of the Amazon in Brazil and Bolivia, where, as specialist in rubber investigation, he has been studying the present status of the industry for the Department of Agriculture.

The objects of the expedition were as follows:

(1) The investigation of the present state of the industry in Brazil, including the extent of wild rubber and the methods of production.