the telephone, the internal combustion engine, aircraft, the steam turbine, the special steels and alloys which metallurgists invent for every particular need, wireless telegraphy, the thermionic valve as receiver, as amplifier, as generator of electric waves. To that last we owe the miracle of broadcasting. Who, a generation ago, would have imagined that a few yards of stretched wire outside the window and a magic box upon the sill should conjure from adjacent space the strains of Beethoven or Bach, the exhortations of many platforms, the pessimism natural to those who forecast the weather and the optimism of orators who have newly dined?

Sounds and sweet airs, that give delight and hurt not.
Sometimes a thousand twangling instruments . . .
And sometimes voices . . . that, when I waked,
I cried to dream again.

I don't know any product of engineering more efficient than that magic box. It needs no attention; it is always ready for service; and when you tire of it you have only to switch it off. A blessing on it for that! Heard melodies may be sweet, but those unheard are often sweeter. Do you ever reflect, when you pick and choose among the multitude of airs and voices, or shut out all from your solitude of thought, that they are still there, physically present, individual, distinct, crowding yet not interfering, besetting you though you do not perceive them, silent until you determine that one or another shall catch your ear? Go where you will, to the ocean or the wilderness or the pole, you can not escape that vast company of attendants; they come to you, unheard, unseen, from every quarter of the globe with a swiftness no other messengers approach. Is any fairy tale so strange as that reality? In all the wizardry of science surely there is nothing more wonderful than this.

THE NEW HYDROBIOLOGICAL LABORATORY ON THE CHESAPEAKE[1]

By Professor JAMES G. NEEDHAM
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I BRING you the congratulations of the hydrobiological fraternity. This is a fine laboratory in a wonderful environment, with live problems at its very door. It is an undertaking of great promise. It brings research facilities to the problems. In laboratories remote from the sources of experimental materials, far too much work is done with a few weazened specimens and under conditions that put a strain on their very existence. Here one may work in the midst of all the wealth of nature, and may know that he is dealing with natural conditions. Here the training of the university laboratories and the facilities of the field may come together, and practical problems may be met in a practical way.

Here are vast natural resources, and we know right well that there are difficulties in their management. It is time to stop guessing as to what should be done, and time to start fact-finding with adequate facilities. More knowledge is needed. Understanding leads to control.

We marvel to-day at the changes that have come over human affairs in our own time. Science seems to be transforming the world and the rate of its progress is ever accelerating. And why? Is it not because society has become aware of its own intellectual resources and has begun developing them, first, by offering encouragement to invention, and, latterly, by offering encouragement to research? Invention is encouraged by the instrumentality of the patent office; research by the experiment stations and by laboratories such as this one. Science began to make the world over when it became cumulative; when observers began to preserve detailed records of observations and experiments; when its problems were analyzed and split into manageable parts and tackled one at a time; when it organized cooperation and provided for comparison and criticism of results and put these results into economic use.

The spirit of inquiry into the processes of nature lies at the root of all human progress. Scientific curiosity has been called "the divine instinct." It sets us apart from all other creatures. We seek to know. Of all creatures living on the earth, we of the human species are the most inquisitive. We share with animals certain states of mind—joy, fear, anger, curiosity, etc.—and manifest them by like behavior. We probably do not get more frightened or more angry than some other creatures, but we are far more curious to know about things. Therein lies a difference that in its cumulative results sets us so far apart from other living things as to make us seem like another order of things. This desire to know is responsible for the development of all our science.

It is a great pleasure to come to this beautiful spot and to share in these exercises at the founding of a biological laboratory in a place where life does so abound, and where every turn invites to its pleasurable contemplation. How bountiful nature is

[1] Remarks at the dedication of the Biological Laboratory on Solomon's Island, Maryland, July 19, 1932.

toward the waterside! What an astonishing abundance and variety of both plant and animal life she bestows there! We have been too long content to say, "What a pity that so little of it is of any use to us!" But how much of the wild life of the upland is of any use to us? If we have found out how to manage in our own interest the products of the upland field, and have no water gardens, that is our own fault and not nature's. Earth yields her increase quite impartially. We have studied intensively the problems of the land, and only haphazardly those of the water.

Agriculture has its experiment stations in every state in the Union, doing for the crops of the land what ought next to be done for crops of the water. Valuable aquatic animals should be studied, as land animals have been, until we know every detail concerning their food, their enemies, both predatory and parasitic, their times and seasons, and the conditions that make for their increase. This means research—sustained research, which is the work for patient investigators. It will for the most part be done by men working alone, for nature does not yield up her secrets to a crowd, or even to a committee, but only to her humble and watchful devotee. After a discovery of a fundamental nature has been made, then cooperation is needed to learn the limits of its application. Life is a complex of changing factors, and environment is a complex of unstable conditions. A good method is a good method only locally and under certain conditions. It needs to be tried out, zone by zone, and province by province; and the cooperation of many hands in many places is often needed to find its limitations and its true economic value. Field laboratories like this should be maintained, if not in every state, at least in every principal region of North America, for the study of aquatic biology and for the development of a real aquiculture.

This laboratory will be of service to the great coastal region of the eastern United States, but it will especially serve Maryland; for the problems of the Chesapeake, due to conditions peculiar to the Chesapeake, can be studied best in the Chesapeake. The State of Maryland is to be congratulated on this enterprise. It is well conceived for the betterment of her vast aquatic resources. Here she provides facilities for research, for fact-finding, concerning these resources. It is quite safe to predict that this will prove to be one of her best investments.

It is altogether appropriate that this laboratory should be located here, near where that great American zoologist, William Keith Brooks, made his pioneer investigations and prepared his monumental work on the oyster. It starts with the goodly tradition of his excellent work. It will be well if this laboratory can retain his interest both in pure science and in its applications to human welfare.

OBITUARY

CARL LEO MEES

DR. MEES, who died on April 20, 1932, was born in Columbus, Ohio, on May 20, 1853, son of the Rev. Konrad and Elise (Adam) Mees. His father was a native of Germany and came to this country when a young man, settling first in New York and later going to Columbus, where he served one congregation for over 50 years.

Dr. Mees' early education was received from private instructors. At the age of about 11 years he entered the eighth grade of the public school and was graduated from the Columbus High School in 1869. While a student in high school he acted as assistant to Dr. Thomas C. Mendenhall, his instructor in physics, and from him received the inspiration which led him to specialize in physics and chemistry.

After completing his high-school work, Dr. Mees entered Starling Medical College in 1870, and in 1871 became assistant to Dr. Thomas G. Wormley, at that time one of the greatest authorities in the world on poisons and the foremost chemist in legal expert work in the United States. Dr. Mees' work was along the line of perfecting the methods of the detection and identification of human blood and tissues in suspected murder cases.

In the course of this work he devised and perfected a method of microscopic identification which was accepted throughout the profession. He was the first to succeed in photographing different kinds of blood for comparison and exhibition to juries. This work was standardized and accepted in the United States army and navy museum. Some 100,000 blood measurements were made by this method.

Dr. Mees took the medical course in Starling Medical College parallel with his work in chemistry and received his degree in medicine in 1875. However, he never practiced medicine. The two following years were spent in the Ohio State University, then known as the Ohio Agricultural and Mechanical College, where he devoted his time to the study of physics under Dr. Mendenhall. During this period he continued to act as assistant to Dr. Wormley and gave lectures upon the microscope in Starling Medical College and upon chemical laboratory practice in Columbus Medical College.

In 1875, Dr. Mees was elected professor of physics