

H. W. OLDS: 'Form in Bird Music.'

F. A. LUCAS: 'Ancient Birds and their Associates.' Illustrated with lantern slides.

PAUL BARTSCH: 'Observations on the Herons of the District of Columbia.' Illustrated with lantern slides.

FRANK M. CHAPMAN and LOUIS AGASSIZ HUERTES: 'Bird Life in the Bahamas.' Illustrated with lantern slides.

WM. DUTCHER: 'Report of the Chairman of the Committee on the Protection of North American Birds.'

T. S. PALMER: 'Federal Game Protection in 1902.'

JONATHAN DWIGHT, JR.: 'Some Variations in the Piping Plover.' (*Ægialitis meloda*.)

WM. H. FISHER: 'Nesting of the Red-bellied Woodpecker in Harford County, Maryland.'

B. S. BOWDISH: 'Some Food Habits of West Indian Birds.'

WITMER STONE: 'The Significance of Trinomials in Nomenclature.'

ELON HOWARD EATON: 'An Epidemic of Roup in the Canandaigua Crow Roost.'

The next annual meeting will be held at the Academy of Natural Sciences, Philadelphia, commencing November 16, 1903.

JOHN H. SAGE,  
Secretary.

#### A GRADUATE SCHOOL OF ENGINEERING RESEARCH.\*

In the charter granted to the incorporators of the Institute of Technology forty-one years ago, they and their successors were made a body corporate for the purpose of instituting a society of arts, a museum of arts, and a school of industrial science. In addition the purpose and aim of the corporation was then declared to be to aid 'generally by suitable means the advancement, development and practical application of science in connection with arts, agriculture, manufacture and commerce.'

This intention to advance and to develop the practical applications of science has

\* Extract from an announcement about to be issued by the Massachusetts Institute of Technology.

been steadily kept in view, and the corporation and faculty of the Institute have striven constantly, in the four decades of its history, to advance the quality of instruction and to enlarge the facilities for laboratory practice. The curriculum of studies offered to undergraduate students of the Institute has gradually changed with the growing demands of the industrial life of the country. New engineering courses have differentiated themselves from those originally established. At its foundation the Institute offered but three distinct courses for engineers—civil, mechanical and mining engineering. To-day it offers, in addition to these, courses in electrical engineering, chemical engineering, sanitary engineering and naval architecture; and in several of these branches applications of science are employed which forty years ago were unknown. Thus biology brings to the aid of the sanitary engineer to-day a technical knowledge absolutely essential in his profession which was impossible forty years ago.

The demands of modern civilization call for engineers who can do more than keep abreast of the theory and practice of their profession. They must be able to solve new problems and to advance the state of the art in which their work lies. In applied science no less than in pure science there is need for research and for the development of the research spirit. Problems of immense practical importance are pressing for immediate solution. Such questions as the cheapening of electric power, the problem of long-distance transmission, the purification of streams and the sanitary engineering of great cities, the numerous applications of chemical engineering to the arts, furnish numerous problems of investigation whose solution affords at once the keenest intellectual exercise and the most practical and useful results. The larger industrial and manu-

facturing establishments are themselves conducting independent laboratories of research, and there is an increasing demand for men who have not only the training of the technical school, but the attitude of mind to attack new problems; men who have not simply a basis of theoretical and practical knowledge to begin research, but who have the spirit of research as well.

This demand for research in engineering and for men capable of undertaking such work has long been recognized, and the Institute has for some years looked toward the inauguration of a department of engineering research. The installation this year of the Lowell Electrical Engineering laboratories, with the additional facilities which are thus offered, makes the present an opportune time to undertake this work. A graduate school of research will therefore be established as a distinct department of the Institute immediately after the opening of the next academic year—namely, on October 7, 1903—under conditions which are given in the announcement that will be issued.

An examination of these conditions will make it clear that the intention of the authorities of the Massachusetts Institute of Technology is to provide in the Graduate School of Engineering Research facilities for a small number of advanced students who show capacity for research.

The administration of the School is vested by the corporation and faculty in a council of members of the faculty, including the president as chairman.

The staff will consist of professors and instructors of the Institute and other persons actually engaged in engineering enterprises.

Opportunities for advanced study and research will be provided in the following branches of engineering:

Civil Engineering.

Sanitary Engineering.

Mechanical Engineering.

Electrical Engineering.

Naval Architecture and Marine Engineering.

Mining Engineering and Metallurgy.

Chemical Engineering and Industrial Chemistry.

In these subjects the degree of Doctor of Engineering (Eng. Dr.) will be awarded. As heretofore, the Institute will offer courses of advanced study and research in pure science—*e. g.*, mathematics, mechanics, physics, chemistry, biology and geology—leading to the degree of Doctor of Philosophy (Ph.D.). These advanced courses will be open also to students of engineering research.

#### SCIENTIFIC BOOKS.

DR. MEYER ON SOME EUROPEAN MUSEUMS.

PENDING the publication of the final part of his memoir on the museums of the eastern United States, Dr. A. B. Meyer has given us the results of his observations on some of the museums and other educational institutions of Great Britain and eastern Europe. These were visited in order to make comparisons between them and similar institutions in America, and to gather all possible information regarding museum buildings and installation. The present paper deals especially with the three great problems of light, heat and ventilation which confront the architect of every large museum, although the reader will find information on all points of interest. The complaint is made that many desired illustrations were not to be had, and it has been suggested that the present demand for the illustrated postal card has much to do with the lack of good-sized photographs of many important buildings.

In regard to lighting Dr. Meyer is emphatically of the opinion that the proper method is by side windows and preferably by windows on both sides of exhibition halls, in order to check the reflection from the glass of cases standing in shadow. The most customary method of lighting is by overhead skylights, in order to gain wall space, but while this is well enough for a single floor, when one or two galleries are introduced it