work. As an initial contribution, I would be glad to deposit now, under certain conditions, some 10,000 herbarium specimens, including cotypes of a large number of new species, and several hundred thousands of specimens of insects, including a large number of types as well as cotypes. Even this contribution alone it would be a pity for America to lose.

I can not, in the limits of a single letter, of this nature, present this matter in all of its more important phases. I believe that it merits your most active interest, and I hope that you will give it the most careful consideration, and then champion it, in so far as it may be possible or feasible for you. Especially, I wish that you would bring it to the attention of any others who would be likely to be interested in the matter, and also, where possible, bring it to the attention of museums, societies, or public institutions, which would be likely to consider taking an active interest in the promotion of this work. I believe that American biology greatly needs the assistance, the light, and the modifying influence that would result from active interest in one of the greatest and most important of the faunæ and floræ of the Orient. C. F. BAKER

LOS BAÑOS, PHILIPPINES

## THE PRESENTATION OF THE JOHN FRITZ MEDAL TO ELIHU THOMSON[1]

IT is a pleasure to take part in this tribute of respect to Professor Thomson not merely because of my association with him in the management of the affairs of the Massachusetts Institute of Technology, and the high personal regard that association with such a man entails, but because I realize that he is an educational force of great potency and that it is in the very highest interests of education that his merits should be widely appreciated and at least occasionally acclaimed. In view of what those who have preceded me have said, it must be unnecessary, especially to such an audience as this, to review in detail his remarkable career. All who know anything of the subject know that in the field of electrical engineering his work has been most brilliant and that his contributions to the development of the great science on which so much of our modern conveniences depend will easily bear comparison with those of any man now living. To the public at large this will seem an exaggeration, but the public has little sense of values where such achievements as Professor Thomson's are concerned, and in this case it is handicapped in arriving at the truth through Mr. Thomson's deliberate unwillingness, I might perhaps say his utter incapacity, to advertise himself in the slightest degree.

Much nonsense has been spoken and written about the merits of national expositions, and amongst the statements that might fairly be placed in this class is one to the effect that it was the Paris Exposition of 1878 that *made* Thomson an inventor. It has been forces within Professor Thomson far more than forces outside that have contributed to his great success. He was twenty-five years of age at the time of the Paris Exposition and had already received a sound scientific training and earned distinction in his chosen field. Doubtless his visit to the Exposition stimulated his imagination and gave an incentive to his work, but it can hardly have made him an inventor. Be that as it may, it was not long thereafter that he became a marked man, through his notable contributions to science and its industrial applications. His earliest inventions comprised a comprehensive system for electric arc lighting and I have been told that in those pioneer days his arc-light dynamo was described by a German as "an American machine that violates every known law of the electrical art." This indicates how far Thomson was in advance of his day and on what insecure foundation the electrical art of the time was resting, for the same learned German had to admit that the machine was the most effective and successful dynamo on the market. This was only the beginning of a long series of triumphs that have led, it is said, to over five hundred patents, a large number of them embodying underlying principles so wide in their application that they might almost be classed

[1] Massachusetts Institute of Technology, December 8, 1916.

as physical laws. Amongst his conspicuous achievements is his invention of electric welding about 1880, one of the great inventions of the last generation, and one whose far-reaching importance is not yet fully appreciated. His early lightning arrestors disclosed the magnetic means of blowing out an electric arc which has remained to this day an important feature of many electrical devices. His watt-hour meters are still in use for measuring the current delivered by electric companies to their customers, although the first patents thereon were granted a generation ago. Among his many other notable inventions are his constant-current transformer, his high-frequency transformer, his alternating-current repulsion motor and his automatic regulator for constant-current dynamos.

It is certain, however, that no mere enumeration of inventions suffices as a measure of the man. It does not even suggest the whole story on its strictly scientific side. Many men come to an end of their rope when they have made a specific invention. It is only a few who can correlate a series of inventions into an organized machine that will be effective and economical, and among such men Thomson is transcendant. Apart from this, however, as with all scientists of similar quality, the man is far more than the inventor. It would be an impertinence on my part to give you the full measure of the man, but perhaps I may be permitted in the few minutes that are left to me to touch on one or two aspects of his personality that are indicative of qualities making powerfully for his own success and contributing largely to his stimulating influence on others.

Much has happened in recent years to awaken the world to an appreciation of the fact that industrial improvement and national well-being depend very largely on the progress of science. Consequently, more attention is being given now than ever before to the problems of the schools of applied science. One of the greatest of the problems that confront these schools is the problem of finding adequate means of encouraging the spirit of scientific research. We must, of course, do this through our teachers and the fundamental problem is to find and to attract men who combine two rare qualities, first, the power of extending the boundaries of knowledge and, second, the power of stimulating others to equally effective endeavor. Thomson, had he continued in the schools, would have made the ideal teacher in this respect. He did not so remain, but it is fitting, I think, that people still insist on calling him "Professor." This is a reminder of the fact that he has been and is a great teacher in the sense that I have indicated, although happily his influence has not been confined to any single school. Throughout his life he has not only done great things himself, but shown an intense desire to help all who are struggling earnestly with a scientific problem. He has proved an inspiration to an ever widening circle of engineers and others who have entrusted him with their secrets and sought his help in overcoming their difficulties. They have done this knowing that they had only to ask in order to get the full benefit of his imagination and his power, and that they need have no misgivings that he would take any advantage of their confidence or any credit for their work, for he has no touch of selfishness. That is a great and rare thing in itself, but, of course, there are many other factors that have contributed to the making of the man. Perhaps not the least of these has been his all-roundedness as a man of science. In these days of increasing specialization men's vision is often narrower rather than wider as they advance in years. Thomson so far as his interests are concerned has taken the whole field of scientific development for his parish, not, of course, that he cultivated the whole field; but he has an intelligent interest in and an extraordinarily wide knowledge of what is going on in almost every portion of that field. Doubtless, this has helped him tremendously even in the narrowest region of a particular specialty. Another great aid to his success has been his thorough appreciation of scientific method. There has never been anything haphazard about his processes, although those that do not understand have sometimes said that men like Thomson do things "by instinct." What this really means is that such

men have thought so long and so effectively on the problems in which they are interested and have observed so accurately that an understanding of the fundamental phenomena has become part of their very being. Their instinct is like the instinct of an experienced helmsman, the result of long training and practise. It has sometimes seemed to me that not the least significant fact in regard to Professor Thomson's work is the fact, known to those who have had the pleasure of seeing him in his home, that his laboratory is built right into the home and is an integral part of it. Probably thoughts on scientific problems are never wholly absent from his mind, although he may be consciously thinking of quite other matters. It can hardly be necessary to say that a man who has achieved what Thomson has done must be more than I have pictured, an unselfish, generous, well-trained, well-rounded, well-balanced man of science. Above all and pervading all must be imagination, not necessarily the imagination of a poet, but something akin to that in quality and in power, and it is of course mainly because Thomson is a man of imagination in the highest sense that he has achieved so much success and earned so much respect not only in this country, but throughout the scientific world. He has been literally showered with honors and it must be almost a unique thing to obtain two great national medals within almost a week, one from the Royal Society of London, and the other the great honor of the Fritz medal that is now to be awarded. I heartily congratulate the board of award on having found a man worthy to be placed beside the greatest whose names have already given distinction to their selections, like Graham Bell, Edison and Kelvin. Such a one undoubtedly is Elihu Thomson. Long may he be preserved to us.

RICHARD C. MACLAURIN
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

## THE CONVOCATION-WEEK MEETINGS OF SCIENTIFIC SOCIETIES

THE American Association for the Advancement of Science and the national scientific societies named below will meet at New York City, during convocation week, beginning on Tuesday, December 26, 1916:

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.—President, Charles R. Van Hise, president of the University of Wisconsin; retiring president, Dr. W. W. Campbell, director of the Lick Observatory; permanent secretary, Dr. L. O. Howard, Smithsonian Institution, Washington, D. C.; general secretary, Professor W. E. Henderson, Ohio State University; secretary of the council, Dr. C. Stuart Gager, Brooklyn Botanical Garden.

*Section A—Mathematics and Astronomy.*—Vice-president, Professor L. P. Eisenhart, Princeton University; secretary, F. R. Moulton, University of Chicago, Chicago, Ill.

*Section B—Physics.*—Vice-president, Professor H. A. Bumstead, Yale University; secretary, Dr. W. J. Humphreys, U. S. Weather Bureau, Washington, D. C.

*Section C—Chemistry.*—Vice-president, Professor Julius Stieglitz, University of Chicago; secretary, Dr. John Johnston, Geophysical Laboratory, Washington, D. C.

*Section D—Mechanical Science and Engineering.*—Vice-president, Dr. H. M. Howe, Columbia University; secretary, Professor Arthur H. Blanchard, Columbia University, New York City.

*Section E—Geology and Geography.*—Vice-president, Professor R. D. Salisbury, University of Chicago; secretary, Professor George F. Kay, University of Iowa.

*Section F—Zoology.*—Vice-president, Professor G. H. Parker, Harvard University; secretary, Professor Herbert V. Neal, Tufts College, Mass.

*Section G—Botany.*—Vice-president, Dr. C. Stuart Gager, Brooklyn Botanical Garden; secretary, Dr. A. F. Blakeslee, Cold Spring Harbor, N. Y.

*Section H—Anthropology and Psychology.*—Vice-president, Dr. F. W. Hodge, Bureau of American Ethnology; secretary, Professor George Grant MacCurdy, Yale University, New Haven, Conn.

*Section I—Social and Economic Science.*—Vice-president, Louis F. Dublin, Metropolitan Life Insurance Company; secretary, Seymour C. Loomis, 69 Church Street, New Haven, Conn.

*Section K—Physiology and Experimental Medicine.*—Vice-president, Professor Edwin O. Jordan, University of Chicago; secretary, Professor C.-E. A. Winslow, Yale University.