am not aware that it has ever been distinctly and clearly expressed."

In all these researches of Faraday, one has to remember that he was working in a time when one did not think in quantitative terms, as we do to-day. There was no ohm, no ampere and the like in terms of which to talk. When he speaks of measurements he talks in such terms as: "the voltaic current which I used upon this occasion was that of five pair of grove cells. The electromagnets were of such power that the poles would seem to sustain a weight of from twenty-eight to fifty-six or more pounds." Then again when citing experiments on the effects of different quantities of charge he talks of the number of rotations which he makes in the wheel of his electrical machine. On the other hand, in these experimental situations, just as in his theoretical discussion, he shows an intuition so well described by one who said, "He smells the truth." In using the crude galvanometers of the day to investigate some of the phenomena of induction, he comes to the conclusion that it is better for the purpose in hand to use an instrument with one turn in its coil than to use one with many. For he says, "Such a wire had abundant conducting power; and though it passed but once around each needle, gave a reflection many times greater than that belonging to the former galvanometer." Again when he is obtaining current from a battery of cells he finds that it is better to join them up in a combination of what we call series and parallel, than to adopt either of these methods exclusively. The only place where he gives a suspicion of failing in a minor way to recognize the full significance of the elements involved is where, on making a simple arithmetical calculation concerned with measurements which are necessarily rough and semi-qualitative in nature, he expresses his calculations and results to seven significant figures.

Some of his last work concerns meditations on the nature of light which he tried to visualize simply as undulations of his line of force; and, while he did not carry the development of this matter very far, it is significant that here also he "smells the truth"; for, as so vividly portrayed in the calculations of radiations, we see the essential element of the electromagnetic waves, from a charged particle in motion, for example, as resulting from a super-position of ripples upon the lines of force of the charge in such a manner as to leave intact the permanence of those lines of force as regards the constancy of their flux through a closed surface surrounding the charge.

And so we come to the close of the career of this great prince of experimentalists whose labors fired the spark which has illuminated the whole realm of modern physics. As age crept on, his forgetfulness increased more and more. His last lecture was delivered in 1862, and the same year saw his last experiment. As he felt his powers weaken he laid aside his duties one by one. He was invited to assume the presidency of the Royal Society but declined. It was inevitable that the managers of the Royal Institution should feel it fitting that, as his career drew to a close, he should be asked to be president of the institution to which he had brought such lasting fame. But he felt that the duties of this position, if conscientiously performed, would be beyond his powers at the time, and he was not one to take the task and, in carrying it through, fall below the standard set by his very high ideals. The closing years of his life were spent near Hampton Court in a house placed at his disposal by the Queen in 1858; and it is a comforting thought that in spite of the weakening of his powers time treated him kindly as regards his general health. He suffered from no disease, and his end came without pain on the 25th of August, 1862, while seated in a chair at his desk.

OBITUARY

NORIFUMI OKAMOTO

ON February 17, 1931, Japan lost one of the foremost scholars in the field of the history of her native mathematics, Mr. Norifumi Okamoto. In the oriental countries it is not enough that such a man should be well versed in mathematics as a science; for this he may be without the ability to read with any ease the works of the classical writers of his own language. This is due to the fact that modern mathematics makes use of terms and methods unknown to ancient writers, whereas the terminology used by the latter is like medieval Latin words to a modern student of analysis. In the person of Mr. Okamoto both necessary elements for the interpretation of the classics were combined, for in his youth, before the Restoration, he was taught the mathematics of the past, and after the abolition of the shogunate he took up the study of the occidental works in the same field. He was one of a band of young and enthusiastic teachers to make the first Japanese translations or adaptations of European text-books and thus to bring into the modern schools of his country the ideas of the western world.

When the Japanese government decided to establish normal schools as part of its modernizing program he was appointed the principal of one of these institutions, and when the Peers' College was founded it was to him that the authorities turned for advice,

and it was he who became the first head master. In later years he taught in the Military Officers' School at Tokyo, and was for a time the superintendent of the Seijo Gakko, or Middle School. During all these years he devoted a great deal of time to the study of the mathematical classics, fitting himself to become a worthy successor to Mr. Endō, whose work on the history of Japanese mathematics is deserving of being ranked as itself a classic. He was also much interested in the subject of geometric transformations as treated by Ushijima Seiyo and Hodoji Zen and had planned to publish a work upon the subject, a project that he did not live to carry out.

For some years before his death he was engaged in preparing a catalogue of the large collection of early Japanese mathematical manuscripts and printed books in the Imperial Academy at Tokyo, a line of work for which he was admirably fitted.

In manner he was a "gentleman of the old school," kindly and yet reserved. He wrote but little, always hesitating to put on paper that which he felt to be in need of further perfecting. Perhaps it was as well that this was the case, since it left him more time for work upon the library, a task which was left unfinished but which was complete as far as he went.

I am indebted to friends in Japan for much of the above information concerning Mr. Okamoto's life, and to my own impressions of him formed on a visit to the library only a year ago. If Japan should induce Mr. Mikami to carry on the labors of his friend, this would be looked upon by western scholars as fortunate for the development of the history of the native mathematics of that country.

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MEMORIALS

DR. GEORGE H. BIGELOW, commissioner of health of Massachusetts, will deliver the sixth Hermann M. Biggs Memorial Lecture, May 7, at the New York Academy of Medicine. The subject of the lecture will be "Will Physicians Practice Preventive Medicine?" The lectureship, founded by the widow of Dr. Biggs, was until this year administered by the New York Tuberculosis and Health Association and the Medical Society of the County of New York. Previous lectures were given by Dr. William H. Park, 1925; Dr. S. Lyle Cummins, Cardiff, Wales, 1926; Dr. Allen K. Krause, 1927; Dr. Charles-Edward A. Winslow, 1928, and Dr. John H. Stokes, 1929.

THE issue of *Wiener medizinische Wochenschrift* for March 14 is dedicated to the memory of Professor von Basch, the father of clinical sphygmomanometry, who died in 1905.

IT is planned under the auspices of the academy at Béarn to erect a monument at Pau to Charles Moureu, the organic chemist who died on June 13, 1929, in memory of his services to science. The monument will be executed by the sculptor E. Gabard. Busts will be placed in the Collège de France and the Faculté de Pharmacie in Paris.

RECENT DEATHS

PROFESSOR FRANCIS X. DERCUM, from 1892 to 1925 professor of nervous and mental diseases at Jefferson Medical College, Philadelphia, since 1925 professor emeritus, died suddenly on April 23 while presiding at the business session of the annual meeting of the American Philosophical Society, which he had served as president for seven years. Dr. Dercum was seventy-four years old.

THE death is announced of Dr. George Martin Kober, professor of hygiene and dean of the School of Medicine of Georgetown University until his retirement as dean emeritus in 1928, on April 24. Dr. Kober was eighty-one years of age.

DR. JOHN A. FOOTE, pediatrist and dean of the Georgetown University Medical School, with which he had been connected twenty-five years, died on April 11, at the age of fifty-seven years.

PROFESSOR ARTHUR J. WOOD, head of the department of mechanical engineering at Pennsylvania State College, died on April 18 from injuries he received when he was struck by a motorcycle. Professor Wood was past president of the American Society of Refrigerating Engineers, former associate editor of *The Railroad Gazette*, and until 1918 associate editor of *Railroad Mechanical Engineering*.

EDGAR BOYD KAY, formerly dean of the School of Engineering of the University of Alabama and chief of the hydraulic and sanitary division, quartermaster's office, United States Army, has died, at the age of seventy-one years.

THE death is reported by *The British Medical Journal* of Dr. Jean Baptiste Coppez, professor of ophthalmology at Brussels from 1891 to 1905, aged ninety years; Dr. Auguste Slosse, professor of physiological chemistry at Brussels; Dr. Paul Frangenheim, professor of surgery at Cologne and an authority on bone surgery, aged fifty-four years; Dr. Giulio Tuno, a physiologist of Rome, and Professor Vogt, a Moscow pathologist, aged eighty-three years.

THE death is announced of Dr. Hermann Matthes, professor of pharmaceutical chemistry in the University of Königsberg, and of Dr. Wilhelm Semmler, professor of chemistry at the University of Breslau.