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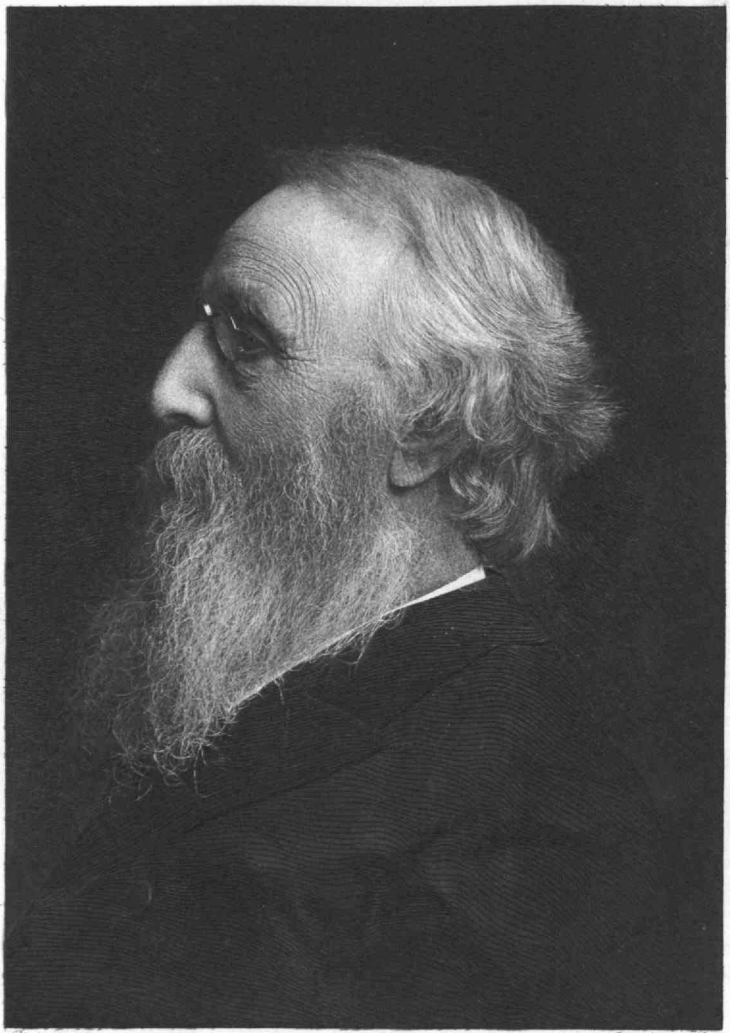

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John D. Runkle.

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VOL. IV. JULY, 1902 No. 3

JOHN DANIEL RUNKLE*

1822–1902

S.B., A.M., Harvard, 1851; Ph.D., Hamilton, 1867; LL.D., Wesleyan, 1871.

Professor of Mathematics, 1865–1902; Acting President, 1868–1870; President, 1870–1878.

John D. Runkle was born at Root, N.Y., and died at Southwest Harbor, Me., near the close of his eightieth year. More than half of his long life was devoted to the creation and upbuilding of the Massachusetts Institute of Technology, of which, next to President Rogers, he was the chief founder. It is a forcible reminder of the brevity of our corporate existence that it dates only from the middle age of our friend who but yesterday was with us. A review of the Institute's life is a review of the later chapters of his own.

As a boy, he led the self-helpful life of the farm, heavily handicapped in the struggle for education, but none the less certain of ultimate success. Not until 1847 did he enter college, the newly established Lawrence Scientific School of Harvard University. His name stands alone in

* The writer of this paper is indebted to the excellent account of Professor Runkle's life contained in the *Technique* of the class of 1901. The effective researches on which it was based make it a valuable contribution to the history of the Institute.

the catalogue of 1848–49 as "student in mathematics." Edward Everett was President; the Faculty of the Scientific School included Eben N. Horsford as Dean, Benjamin Peirce, Louis Agassiz, Asa Gray, Jeffries Wyman, Joseph Lovering, J. W. Webster, and the Bonds. John W. Draper and James E. Oliver were fellow-students; Josiah P. Cooke and William T. Harris, resident graduates. No diploma was offered, but certificates of the number of terms of attendance and of the studies pursued were given. The number and choice of studies were optional. Attendance was voluntary. "The government of the University wish wholly to discourage the resort of young men to the Scientific School who do not possess that stability of character and firmness of purpose which will insure a faithful performance of duty without academic discipline." Runkle was a member of the first graduating class, of 1851, with Joseph Le Conte and David A. Wells. He received the degree of Bachelor of Science, and at the same time, for high scholarship, the honorary degree of Master of Arts. It is interesting that Runkle, after his own graduation, brought two of his four younger brothers to Harvard.

At the middle of the last century, scientific work in the United States was limited alike in scope and in estimation. The colleges — as well as those called universities — naturally included mathematics in their curricula, though only of an elementary sort, ending with a simple treatment of the calculus. The physical and natural sciences, if not excluded, were in general presented as "information courses," with no possibility of adequate appreciation, except in the occasional case of a student of native genius having the good fortune to secure close relations with an inspiring teacher. Astronomy was, in some measure, an exception. As then understood, it had reached a relatively

high degree of completeness, in the sense that its observed phenomena had been mathematically correlated and made the basis of accurate prediction. At the same time the familiarity of these phenomena, the magnificence of some of them, the overwhelming magnitudes of space and time, stimulated the imagination of the educated public, and developed a degree of popular interest shared only in limited measure by the sister science, geology. It is interesting to note that Rogers came to his Institute work in general applied science through geology, as Runkle came through mathematical astronomy.

It is often not appreciated how modern a development is the science of pure mathematics. The boundary line between pure and applied mathematics is indeed — and fortunately — a vague and shifting one. It may be said that the distinction is mainly subjective, corresponding to diverse attitudes and aims of students of the science. Objectively, pure mathematics is a science based on processes of abstract thinking. Applied mathematics is the corresponding quantitative treatment of concrete phenomena. The pure mathematics of to-day is applied to-morrow or the day after. In 1850 the great researches of the European mathematicians of the preceding half-century were little known in this country. Our own scholars of mathematical bent naturally gravitated into mathematical astronomy,— thus Benjamin Peirce and many of his students.

In this connection it may be remarked that in the preface of his treatise on Analytic Mechanics in 1855, Peirce states that he has been induced to undertake its publication "at the request of some of my pupils, and especially of my friend, Mr. John D. Runkle."

The work of computation for the Nautical Almanac was carried on at this time in Cambridge by a staff including,

among other men of subsequent eminence, Simon Newcomb, Asaph Hall, George W. Hill, T. H. Safford, and J. M. Van Vleck. Mr. Runkle's connection with the Almanac began in 1849, and continued in some form as late as 1884.

In 1858 Mr. Runkle founded the *Mathematical Monthly* on the basis of replies received in response to the following letter, addressed to many of the most eminent mathematicians and educators in the various parts of the United States: —

NAUTICAL ALMANAC OFFICE, CAMBRIDGE, February 13, 1858.

Dear Sir,— Allow me to call your attention to the following considerations: You are aware, that, while almost every science, as well as art, has its own appropriate journal, around which corresponding interests and tastes cluster, by which special research is encouraged, and through which all the valuable results are communicated to the world, the science of Mathematics is still without its own particular organ.

Now it seems to us that such a journal is needed; one that shall embrace, among its contributors, the best talent, in order that younger laborers in the same field may always have before them a high standard of excellence, and that it may be a fair index of the mathematical ability of the country. On the other hand, however, care should be taken not to graduate it, as a whole, too high above the average attainments of mathematical students: otherwise, only the few would be interested in it or benefited by it. It should therefore embrace in its pages solutions, demonstrations, and discussions in all branches of the science, as well as in all its various applications.

It should contain notes and queries, notices and reviews of all the principal mathematical works issued in this country as well as in Europe.

In short, it should be the medium of all kinds of information pertaining to the science, to which a large proportion of our mathematical students have at present no ready access.

Such is, in brief, our idea of the character the journal should possess to insure to it the greatest usefulness and most permanent success. . . . With much esteem,

Yours truly,

J. D. RUNKLE.

Encouragement was received and formal indorsement was given by the American Association for the Advancement of Science and by several educational bodies.

The list of contributors included many distinguished names, among others Arthur Cayley, William Chauvenet, George W. Hill, Simon Newcomb, Benjamin Peirce, John Herschel.

In the "Teaching and History of Mathematics in the United States," Cajori says: —

The time for beginning the publication of a long-lived mathematical journal was not opportune. Three volumes only appeared. On a fly-leaf the editor announced to his subscribers that over one-third of the subscribers to Volume I. discontinued their subscriptions at the close. "I have supposed," he says, "that those who continued their subscription to the second volume would not be so likely to discontinue it to the third volume, and I have made my arrangements accordingly. If, however, any considerable number should discontinue now, it will be subject to very serious loss. . . . I ask as a favor for all to continue to Volume III., and notify me during the year if they intend to discontinue at its close. I shall then know whether to begin the fourth volume. I shall not realize a dollar." This announcement discloses obstacles which all our journals that have been dependent entirely upon their subscribers for financial support have had to encounter, and which none except the more recent could long resist. Moreover, the Civil War was now at hand. On account of the present disturbed state of public affairs the publication of the *Mathematical Monthly* was discontinued.

The foundation of the Massachusetts Institute of Technology, like most notable forward movements, was largely due to the enthusiasm of young men; and the statement does not lose its fundamental significance if it be added at once that youth may designate an attribute of temperament rather than mere fewness of years.

Professor William Barton Rogers came to Boston in 1853, — in his forty-ninth year,— bringing with him not indeed a matured plan for an Institute of Technology, but rather that enthusiasm, insight, breadth of scientific attainment, skill in popular exposition, and fitness for leadership which enabled him to organize success.

He occupied himself in writing and lecturing on scientific subjects, and became the natural leader of a group of enlightened citizens eager for the development of comprehensive plans for educational and scientific institutions in the land then being reclaimed from the tidal waters of the Back Bay. It would be interesting to follow the gradual crystallization of these plans from original relative vagueness into definite symmetry, and incidentally to trace the various influences of acquaintance with foreign institutions on the part of some of the persons co-operating in the general undertaking.

In February, 1859, a meeting was held of "individuals representing Associations of Agriculture, Horticulture, Art, Science, and various Industrial, Educational, and Moral Interests of the State," with a view to memorializing the legislature for a grant of land belonging to the Commonwealth, in aid of a plan for a conservatory of art and science, in line with a recommendation in the annual message of Governor Banks. The plan as elaborated aimed to present scientific information and collections in popular form to a large constituency.

Further progress of this effort up to 1860 is embodied in the "Objects and Plan of an Institute of Technology, including a Society of Arts, a Museum of Arts, and a School of Industrial Science," prepared by Professor Rogers. This exposition was sent to a considerable number of prominent persons, in anticipation of a meeting; and at the meeting a committee of twenty, to which Professor Rogers was added as chairman, was appointed to act generally in behalf of the proposed association, until it should be legally incorporated as the Massachusetts Institute of Technology. Mr. Runkle was a member of this committee, and during the subsequent preliminary steps his name continually recurs. His own review of these developments may be found in an address in memory of President Rogers before the Society of Arts in October, 1882.

In April, 1862, Mr. Runkle, as first Secretary of the Institute, notified Professor Rogers of his election as President of the Massachusetts Institute of Technology, to serve until the first annual meeting, at which time the government for the ensuing year would be elected. At this first annual meeting, Mr. Runkle was elected chairman of the Committee on Publication.

A further development of the embryo school is represented by the "Scope and Plan of the School of Industrial Science," prepared by President Rogers, adopted in May, 1864, and remaining since that time our "intellectual charter."

About this time, President Rogers writes that "with the aid of Professor Runkle and Dr. Watson, a graduate of the *Ponts et Chaussées*, I am framing a course of applied mathematics for our Institute, reaching from the very elements up to the fullest demands of the scientific engineer."

In January, 1865, Runkle writes to Rogers, discussing at