
Biography: W. J. C. Miller

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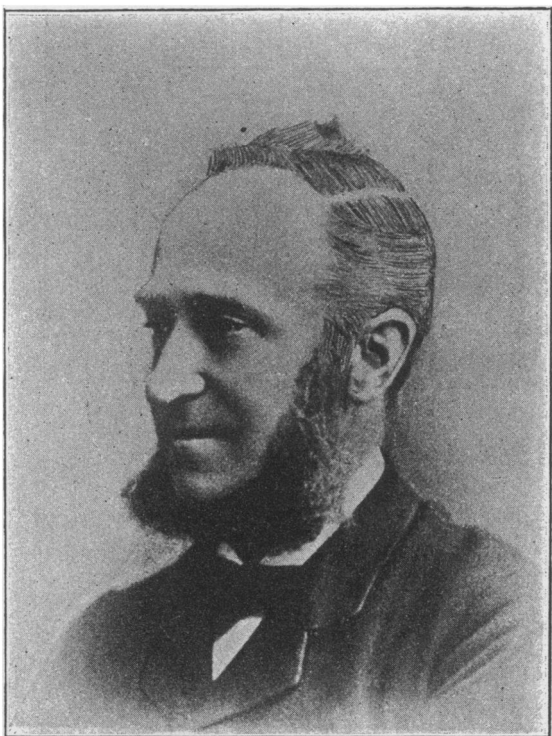
BIOGRAPHY.

MR. W. J. C. MILLER.

BY B. F. FINKEL.

THE native place of Mr. Miller is in one of the most beautiful parts of the South coast of England. Of this district he has given a sketch in an article (in *Nature-Notes* for August, 1894) entitled a "Devonian Headland," which he describes as lying deep within the great West Bay of Dorset and Devon, and to which sea-birds have always flocked as to a chosen retreat. The upland chalk downs end in lofty cliffs that run sheer to the water's edge: and close by, both east and west, clear brooks, which spring from the underlying green-sand, have worn out charming little valleys that bear the Celtic name of combes. The headland itself bears a Norse name, derived from a village that lies in the eastern valley,—it was a little way off on the shores of the same great bay, that the Norsemen had their first historic conflict with the English—but the village itself might well bear a similar place-name with its western neighbor, and be called more appropriately, Chalcombe.

The district was a perfect paradise of birds, with which he became perfectly familiar as a boy, and on which, in later life, he loved to write articles describing their various habits. The mobbing, by a mingled flock of rooks and jackdaws, of a pair of ancient ravens that had built for ages in a neighboring cliff, till, at last, the powerful ravens, worn out by numbers, would find shelter from their tormentors in some wood, or cleft, or cave: the motions and chirpings of the stone-chats and the win-chats in the furze-bushes: the swift and dazzling flight of the king-fisher: the finding of the habitat of the dipper or water-ouzel—a song-bird that dives, and wades, and swims—watching its motions under water, and finding its nest year after year in the same stream: and the delight-



W. J. C. MILLER.

ful turr-turr of the turtle-doves in the woods, reminding him that, for six months, he might say, with Virgil's Melibæus,

“Nec gemere aeria cessabit turtur ab ulmo”:

these and many such sights and sounds he was ever delighted to recall and record.

In such pleasant regions as these, Mr. Miller was born, on August 31, 1832; here he roamed as a boy, always fond of books; and amid these scenes he acquired that love of Nature, and especially of bird-life, that never afterwards deserted him. From the village-school he went to the Independent College of Taunton in Somerset, where he had for a time, the teaching of a distinguished Mathematician; and from there he matriculated with mathematical honors at the University of London. Then came the great disappointment of his life. He was desirous to enter the great mathematical University of Cambridge; but his parents belonged to the sect that had trampled down King, Church, and Aristocracy, one after the other; that had formed an army that had never met, either in the British Islands or on the Continent, an enemy that could stand its onset; and had sent across the Atlantic a band which, fleeing from persecution, had founded the third home of the great English race. Thus they could not endure that a son of theirs should submit to the tests then imposed in the University; so he had to give it up. Years afterward, he learned from eminent mathematicians, that the best of all science was learned by one's own self, and never derived from any Professors at College or University. But he would then have gladly submitted to any test, if he had been allowed.

So he turned to study and instruction in mathematics; and after teaching at various Institutions, became finally Professor at Huddersfield College in Yorkshire, where he remained many years, till he took the post that he now holds. There it was that he devised, and, after many trials, got a Publisher to undertake, the series of Volumes that he has edited ever since, and of which he is now engaged upon the sixty-fifth Volume. It was in 1861 that he conceived the idea of devising some plan whereby the contributions to the mathematical columns of this *Educational Times*, which had been for some years under his Editorship, might be presented, apart from other matter, in a more convenient form than could be furnished by the pages of the Journal; and, after ascertaining the views of his contributors, and obtaining promises of support, the mathematical solutions that appeared in each number were, from Midsummer, 1863, printed off, in the narrow columns then in use, from the journalistic types; and at the end of a year the collection was, in July, 1864, issued as the first of the series. By and by the narrow columns were altered to wider columns; and then the contributors were not content to wait a year for their articles: thus, ultimately, the issues took place at half-yearly intervals.

The series that took its rise from such small beginnings has gone on continuously from that time to this; and is going on still. After 25 years it was necessary to issue a second edition of the first volume; and this was brought out with improvements, uniform with the other Volumes, in the wider columns, in

1886. In these Volumes there have appeared, from time to time, articles in almost all branches of Mathematics, and the leading Mathematicians of all countries have continuously helped the work forward. One valued contributor, among early ones, was Dr. Hirst, F. R. S., who developed, in various articles, those elegant branches of Geometry in which all took a deep interest; and who, at last, collected and published his contributions in a separate Volume. Other important contributors to the early Volumes were Professor Cayley, to whom many articles were due; and the too-early lost Professor Clifford, who, being a fellow Devonian with the Editor, began to write when he was flying kites, and continued to furnish articles that increased in number and value through many volumes, accompanied by letters to the Editor that contained comments and developed views that were often more interesting than the articles themselves. The comparatively new theory of Local Probability was largely developed in the early Volumes by such writers as Woolhouse, Clarke, Crofton, Stephen Watson, our countryman, the late Professor E. B. Seitz who was a great master of difficult Probability Problems, and others. These contributors have all passed into the silent land. From a contributor who, it is to be feared, is getting near it, Professor Sylvester, articles followed in such quick succession that, from the very earliest times, there were but three or four numbers of the Journal, and those through the merest inadvertence, that did not contain, till the very last, at least one of his articles.

In 1876, Mr. Miller obtained the highly responsible post of Executive Officer (Registrar and Secretary) of the General Medical Council, an office in which he has remained ever since, continuing to edit, at his leisure, the mathematical periodical that has now attained to its 65th Volume. Among Editors of Mathematics this is deemed to establish for Mr. Miller what is termed "a Record": seeing that no other Mathematical Editor has ever, it is believed, gone on so long, with such laborious work as this. Always interested in Literature, no less than in Science, he edited for his Students at Huddersfield College a Magazine in which there came forward young contributors who afterward attained to eminence, whereof one has recently written an able book on the geography and resources of Africa.

During this time, he has been living in the finest of all the suburbs of London, in that Richmond whose name has been transferred to many other places, notably to that city which figured so largely in the Civil War. Under the title of "a Bird-loved Suburb of London" he has written an article to set forth its Bird-life, and its many beauties.

Here he founded in 1887, a Literary Society of which he is still President, and before which, on March 20th, one of his Mathematical contributors, Mr. George Heppel, M. A., lectured on the "Origins of European Poetry." In the course of his introductory remarks that evening, the chairman, Mr. Miller, said, "We are this evening entering upon a new departure. Hitherto, the lecturers have been members of our own society, but, in bringing in now for the first time a lecturer from outside, we are adopting a course that might hereafter

be worked out with advantage by our able and energetic secretary. Mr. Heppel is a mathematician, and such men have long been found peculiarly sensitive to the influence of the sister-arts of music and poetry. The very greatest of all living mathematicians [Professor Sylvester] called the attention of the Royal Society, twenty-five years ago, to the coincidence or parallelism, which observation has long made familiar, between the mathematical and the musical ethos: music being the mathematics of the sense, mathematics the music of reason; the soul of each the same. Music the dream, mathematics the working life; each to receive its consummation from the other when the human intelligence, elevated to its perfect type, shall shine forth glorified in some future Beethoven-Gauss."

Other doings of Mr. Miller's during his life in Richmond, and his official duties at the General Medical Council, are set forth in the following article from the *Richmond and Twickenham Times* for August 17, 1889:—

"Those who attended the meetings of the Richmond Athenæum, and the far larger number who read the reports of the proceedings of that body, are familiar with the pleasant, gracefully worded, and often erudite little speeches of Mr. W. J. C. Miller, a member of the council who has always been, in a double sense, a right-hand man to the chairman, sitting upon his right on the platform, and always ready, however abstruse the subject, to save a debate from flagging by filling up the regulation ten minutes with remarks which are always appropriate, often profound, invariably couched in the happiest words, and abounding in quotations from the poets, displaying a memory which is the admiration of all. Comparatively few, however, in Richmond know of the laborious and difficult duties in the world of mathematics to which Mr. Miller has devoted himself for more than thirty years, as editor of the *Educational Times*, or of the position which he has filled for thirteen years as the sole executive officer (registrar and secretary by name) in the management of the business of the General Medical Council.

With regard to Mr. Miller's editorial duties, many eminent mathematicians have given ungrudging testimony to their value. Thus Professor Sylvester—the first of living mathematicians—speaks of him as "an excellent mathematician, extensively and critically versed in all parts of the science, a good writer and lecturer on various subjects of natural science and other parts of human knowledge lying outside his own more special pursuits, and a most able and painstaking editor. . . . His scientific attainments are of a high order; he is deeply skilled in nearly all the departments of the highest mathematics, and is a novice in none. His labour as mathematical editor of the *Educational Times*, in which his own original papers are fit company for those of our foremost analysts, is proof of that. It would be a mistake to suppose him a mere schoolmaster or a mere mathematician. He is a sound classical scholar, and an erudite man of letters." The late lamented Professor Clifford considered that the mathematical portion of the *Educational Times* "has done more to suggest and encourage original research than any other European periodical." Equally gratifying words are used by Sir Robert Ball, Professor Tait, Dr. Hirst, Rev. Dr. Booth, Professor Crofton, Colonel Clarke, Dr. S. T. Hall, Professor Townsend, Professor Young, Dr. Todhunter, Rev. George Salmon, Professor Cayley, Professor Everett, and others whose attainments have raised them to the highest eminence. It has often been said that by Mr. Miller's mathematical work, the culture and study of the science have been more advanced than by any two or three agencies put together, in any or all parts of the world. When he commenced this important work he had but what was then an utterly obscure and almost unknown journal to use as his means of intercommunication and publication. Now he has nearly five hundred vigorous contributors, from all parts of the globe. Many are educated Hindoos (professors and others); many are Americans or Australians; still more are Germans, Frenchmen, Russians, or Italians; some are Spaniards; and some write from the South American Republics.

The multifarious work of the General Medical Council has more than quadrupled since Mr. Miller took it in charge thirteen years ago. Established to carry out the voluminous Medical Acts (which cover fifty-nine pages of the *Medical Register*), the Council had to take charge, in 1878, of all the dentists in the empire, and since then of various other matters, including, quite recently, the registration of sanitary officers. Many testimonies to the appreciation of Mr. Miller's services have been given by the Council, and by the medical newspapers. Thus the *Medical Press*, in a recent article on the General Medical Council, says that—"Every session marks a distinct improvement in the business aptitude of the Council, and in the amount of work accomplished, results which may fairly be attributed in no small degree to a more vigorous presidential control, and to the efficiency of the business arrangements, which depend so much for their success on the services of a competent and attentive registrar." The *British Medical Journal*, in reviewing the *Minutes of the General Medical Council*, says—"The Volume has been edited by Mr. W. J. C. Miller, B. A., the Registrar of the General Council, with the care which he has accustomed us to expect from him." The *Report of the Statistical Committee of the General Medical*

Council is another work of which Mr. Miller has charge, and in noticing this the *Medical Press* says—"We assume that its compilation is chiefly due to the energy and noted mathematical skill of Mr. Miller, the Registrar of the Council, and if we are correct in this assumption we can only remark that both the profession and the Medical Council owe that gentleman much thanks for work which, though no doubt a labour of love, must involve great devotion of time and mental capacity." Another work of the utmost importance to the public, and for the annual publication of which Mr. Miller is responsible, is the *Medical Register*, which has now grown to a volume of 1,198 pages. In addition to this there is the *Dentist's Register* (232 pages), besides the *Medical Students' Register*, the latter alone requiring 100 pages. It would be difficult to speak too highly of the care exhibited in the compilation of these important works. Referring to the issues for the present year, the *Medical Press* says "They display all the progressive improvement which has been manifested since Mr. Miller took them in hand."

Being an ardent lover of science and literature, Mr. Miller has all his life striven to aid others in sharing their delights, by lectures, writings, and teaching. And all this work, editorial and other, has been not only unremunerative, but carried on with no little outlay. But the world's best workers have always been the most unselfish. Mr. Miller has at least the gratification of knowing that his favourite pursuits have been greatly advanced by his efforts, and that he has earned the gratitude of many who have reaped the advantages of his self-denying work."

Mr. Miller was one of the earliest members of the London Mathematical Society; but as he found that, with his official duties, and his Editorial work, he could not spare time to attend the Meetings, he was reluctantly compelled to resign his membership. Since that time, he has had to devote the whole of his small leisure to the duties of his Editorship, which goes on increasing every month, with new contributors from foreign countries, especially India, where an enlarged interest is rapidly growing in all the articles that are published in his Journal. Mr. Miller is a great admirer of America and American ways of managing; he entertains a high opinion of our magazine, and says it is one of the best that comes to him. He has a large circle of friends and admirers in America, most of whom are contributors to the Mathematical Department in the *Educational Times*.

THE EXPONENTIAL DEVELOPMENT FOR REAL EXPONENTS.

By WILLIAM BENJAMIN SMITH, Ph. D., (Göttingen) Professor of Mathematics, Tulane University, New Orleans, Louisiana.

The Exponential Series is of such fundamental and far-reaching importance, it is so indispensable to all higher Analysis, that it seems strange so few if any deductions of it accessible to the English reader should be carefully conducted; not even that given by Chrystal in his superb *Treatise on Algebra* can lay claim to rigor. It may be worth while then, under no pretense of novelty, to attempt to supply this lack in some measure.

I. We consider the expansion given by the Binomial Theorem :

$$\left(1 + \frac{x}{n}\right)^n = 1 + n \cdot \frac{x}{n} + \frac{n(n-1)}{\underline{1} \ 2} \cdot \frac{x^2}{n^2} + \frac{n(n-1)(n-2)}{\underline{1} \ 3} \cdot \frac{x^3}{n^3} + \dots$$