

LOUIS COMPTON MIALL, 1842—1921.

LOUIS COMPTON MIALL was born at Bradford in the year 1842, and was the fifth living son of a Congregational Minister, the Rev. James Goodeve Miall. His mother was Elizabeth Symonds Mackenzie. The teaching element was strong on both sides of his family. The Mialls had been schoolmasters and preachers for generations. One of them, Moses Miall, had published a book of Practical Remarks on Education. The Mackenzies were also much given to schoolmastering, and had come strongly under the influence of the Edgeworths, whose educational methods were firmly established in the family tradition. Sir Morell Mackenzie and Edward Compton, the actor, were first cousins of L. C. Miall on the Mackenzie side, and Edward Miall, M.P. for Bradford and Editor of the 'Non-Conformist,' was his father's half-brother.

The Rev. J. G. Miall was a man of varied attainments, and had a distinct gift for teaching. He bestowed much pains on the training of his children, for he knew that they would have to fight their way in the world on their own resources. He was very particular to train them in self-reliance, to give them studious tastes, and the power of expressing themselves well. He had himself a beautiful speaking voice, which the children all inherited in varying degree, and he taught them to make the best use of it.

L. C. Miall owed much also to his mother. She, like her husband, had a pleasant voice and manner and much charm of personality, and she had a power of holding her children's love and admiration which far exceeded his. She was, above all things, deeply religious, but had so courteous and sunny a disposition that religion, even the terrible early-Victorian religion, could not make her gloomy.

Louis seems to have been an enterprising and high-spirited child, keen about games and mischief, and inclined to wander away from home on solitary expeditions. He was sent first to a little school near his home, and, later, when he was 9 years old, to Silcoates School, near Wakefield, then, as now, a boarding school for the sons of Non-Conformist Ministers.

At the time that he left school, L. C. Miall's interests were all classical and literary. He had learned little mathematics and no science, but had shown himself good at essay writing, and had stored his mind with fine passages from Shakespeare and the Latin poets. He said in after life that he knew nothing of Natural History as a schoolboy, though he tried to make friends with a half-witted boy who could show him, as if by magic, all sorts of strange nests and creatures in places where no one else would see anything. But even in those days he must have been unusually observant, for he tells in the "Natural History of Aquatic Insects" how he and his companions watched the dragon-fly escape from its pupa-case, and how they saw the larva, "with its dingy colours, its forbidding shape, and its predatory habits . . . stretch out its great paw and secure an unsuspecting victim."

In 1857 Louis Miall left school, a boy of fifteen, but looking older, and already grave and dignified. He had probably learnt all that Silcoates had to teach him, and his father could afford to spend no more upon his education, but recognised the lad's ability, and, being anxious to give him further opportunities to study, hit upon a scheme that seemed promising from many points of view. This was that Louis should keep a little day-school, with his father's help and direction, prospectuses for which were accordingly issued in Louis's name. A member of the congregation, who much admired the minister and knew something of his teaching capacity, had already entrusted him with her son's education, and other pupils were soon found to make the nucleus of a small school. The time-table was specially arranged so that Louis should have leisure for private study; his father apparently took a good deal of the teaching into his own hands, and his mother helped with the French, and, altogether, the plan seemed to work out very well. It had its drawbacks, however, the chief of which was that Louis had to study by himself, for, though his father could help him with Latin and Greek, the boy had then no great inclination to continue his classical reading, and was more interested in the new scientific subjects that were attracting the attention of the younger generation.

His eldest brother was a medical student at Edinburgh and Louis often envied his opportunities. Probably it was his example that induced Louis later on to take a course of anatomy at the Leeds School of Medicine. It meant early rising every day to journey from Bradford to Leeds, but the teaching was good and constituted the only training in science that he could obtain.

Meanwhile he was working hard at zoology and geology, and joined a Botanical Society at Todmorden, making many friends who were interested in Natural History and publishing papers in various periodicals. One of these brought him the following letter from Charles Darwin:—

Down, Bromley, Kent.

January 23, 1860.

DEAR SIR,

I hope that you will excuse the liberty I take in writing to you and requesting a favour. In the 'Annals of Nat. Hist.,' vol. 15, p. 39, you remark "The variations of form in the maxillæ are of no value among the Phalangida in affording generic or specific characters as with the true spiders." Am I to understand from the latter part of sentence that with the individuals of the same undoubted species the maxillæ vary in form? Is not this a very surprising fact? Would you have the great kindness, if the fact be so, to give me some details on the amount and kind of variations and in what species. And further would you permit me to quote any such facts on your authority?

With many apologies for troubling you, I beg to remain, Dear Sir,

Yours very faithfully,

CHARLES DARWIN.

One wonders what answer was sent, and whether Darwin was aware that his correspondent was a boy of eighteen.

A couple of years later appeared the "Flora of the West Riding" by Miall and Carrington, with an introduction by Louis Miall, which he repented in later years; for, though it has merits, it is written in a rather high-flown style, and to publish a list of plants and their localities was quite contrary to his maturer teaching.

Besides the difficulty of studying without teachers, there was another drawback to the life that he was leading at this time. His father was strong-willed and autocratic, and Louis' own strong will was frequently at variance with his in the management of the little school. The young man's scientific studies, and the spirit of the age when Darwin and Huxley were fighting for freedom of belief, soon brought religious disagreement into the family circle and Louis' change of faith was a great grief to his parents. It hit his father on all sides, as parent, schoolmaster and minister, and he felt it very bitterly. Altogether the life was neither happy nor hopeful, and the young man decided that it could not continue. He would find work elsewhere, and eventually he took a post as assistant-master in a school kept by Mr. George Todd at Stamford Hill, near London.

Towards the end of the second year there the situation was changed by a letter from his brother Philip, telling him that a Philosophical Society was being started in Bradford, and that Philip was commissioned to write and offer him the post of Secretary to the Society with a salary of £100 a year. This was just what he wanted. He wrote an immediate acceptance and gave notice to leave the school at the earliest moment possible.

This was the turning point in Louis Miall's career. After six or seven years of gradually increasing darkness and discouragement, the horizon cleared, and henceforth he advanced without faltering. When he returned to Bradford he was very raw and inexperienced and had little idea what to make of his new task. The first thing he had to do was to arrange a course of lectures, under the guidance of the Committee, who soon left all the correspondence in his hands. An interesting course of lectures was given between 1865 and 1871, among others by Owen, Huxley and Rolleston, who thus came into personal contact with the Secretary of the Bradford Philosophical Society.

Another thing to which the Secretary had to turn his attention was the making of a museum from a collection of objects mostly given by people who wanted to get rid of them. He finally decided that the only thing he could do was to make a collection of geological specimens for which the neighbourhood offered unusual facilities. He prepared a report to the Committee, in which he offered to collect what he could from the coalfields and limestone districts within reach. For some years it was his delightful hobby to explore the district of Craven, to study its geology and to collect its fossils. A frequent companion of his on these rambles was John Brigg, afterwards Sir John Brigg, M.P. for Keighley, a member of his

Committee, who took a great interest in the young Secretary and influenced him in many ways.

In the course of these excursions quite a respectable collection of fossils and geological specimens was made for the Bradford Museum. Then a great piece of luck befel the Curator. One day there came into his office a coal miner bringing some curious bones that he had found in the Low Moor coal mine. Miall went to see them himself next day, going down a coal mine for the first time in his life. He was shown the bones on the roof of a passage in the works, and realised that they would require very careful treatment if they were to be removed without injury. So it was decided to apply a layer of plaster of Paris to protect the bones and then to have the coal carefully worked away, a prop being placed to support the fragments covered with plaster. The bones were removed in perfect condition except for those that had already been broken off. The block removed was 11 feet long and a couple of feet wide. Investigations proved that the bones belonged to a Labyrinthodont of a species that was hitherto unknown. On the suggestion of the Committee, Miall wrote to Prof. Huxley and offered to take the fossil to London and show it to him. Huxley sent an encouraging reply, the fossil was carefully packed in a wooden case and taken to London, where it was examined with much interest by Prof. Huxley and Prof. Flower. Huxley undertook to write a description of it for the Geological Society and asked Miall to prepare a short account of its discovery and removal from the coal mine. At the next meeting of the Geological Society, Miall read his paper and Huxley gave a simple and interesting account of the new Labyrinthodont, without notes, explaining it from the specimen as he went along. Sir Charles Lyell was present and seemed to be much interested.

When Miall returned to Bradford and gave the Committee of the Philosophical Society a vivid account of what had passed, they asked him to repeat the story in the form of a lecture to the Society. It was his first public lecture. After spending a good deal of time trying to write it out, he resolved to follow Huxley's example and speak without notes, explaining the actual specimen before the audience. There was a good attendance, for the matter had aroused interest in Bradford, and the lecture went off very well. That was the beginning of Miall's career as a public lecturer. After that we find him giving courses of Lectures in Bradford and Leeds mostly on Geology, but also on Botany and the "Early History of Domestic Animals."

Though very shy and studious, Miall seems to have entered somewhat into the social life of Bradford, which happened to be unusually interesting at that time. He was fond of music, and indeed had studied it in his usual way by sheer force of will and without a teacher, so that he had written songs for his sister and could play to some extent on two or three instruments. He also had a good deal of talent for painting. He brought back from a cruise in the Hebrides in 1868 sketches from which he made some clever little water-colour pictures, that still hang beside one or two of his father's in homes of a younger generation.

At Bradford he met his future wife, Emily Pearce, to whom he was married in 1870. Though not scientific, her intellectual and social gifts were, in some directions at least, equal to his own.

In 1871 L. C. Miall was appointed Curator to the Leeds Philosophical and Literary Society. He had already delivered a course of lectures on geology to the Society and was known to several influential people in Leeds. He must have had Huxley's support, too, in his application, for among his letters of congratulation on obtaining the post was one from Huxley, in which he characteristically remarks that it would be a matter of great satisfaction to him to think that he had in any way contributed "to the putting of an indubitably square man into the square hole at Leeds."

His interests at this time were mainly geological, and he devoted himself to the collection of fossils in the Leeds Museum with the same enthusiasm that he had given to the geological collection at Bradford. He was helped in its re-arrangement by Pengelly, Boyd Dawkins, and others. Later, much help and many specimens were given by A. H. Green. When it was re-arranged, he wrote a guide to the collection; in the same way he re-arranged the different collections of birds, insects, antiquities, and so forth, and wrote a guide to each, in which he set forth clearly the general principles of the various subjects.

Since 1869 Miall had been busy with the investigation of the new Labyrinthodont that had been found in the Low Moor coal mine. The task proved more difficult than he had expected. He was Secretary of the Geological Section of the British Association at Edinburgh in 1871, and a Committee was then formed, consisting of Phillips, Woodward, John Brigg, and three others, with Miall as Secretary, to investigate and compare all the known species of Labyrinthodont. It happened that the following summer John Brigg and his friend, Swire Smith (Sir Swire Smith, whose life has been written under the title of 'The Master Spinner'), decided to go to Germany to look into the German system of education and see for themselves how far such a system would be possible in industrial England. They invited Miall to join them, so that he and John Brigg could combine the investigation of Labyrinthodonts with the educational work, all three being in fact interested in both subjects.

They had an instructive tour, and the following year (1873), when the British Association met at Bradford, Miall read the report of the Committee on Labyrinthodonta. The work had been very thorough: "Some of the members have personally examined all the more important Labyrinthodonta in European collections, including at least one example of every species recorded from the British Isles." The report created much interest and brought Miall into general notice for the first time.

Miall was now beginning to concentrate his attention on Biology. He declined the Professorship of Geology at the newly opened Yorkshire College in favour of A. H. Green, a much stronger geologist than he felt himself to be, and henceforth his interest in geology began to wane. He never cared greatly

for mere collection and the minute characteristics of the shells in which animals had lived. He collaborated with A. H. Green, Thorpe, Rücker, and Marshall in a work on 'Coal, its History and Uses,' published in 1878, but his serious interest in geology and palæontology ended about the year 1880. He never studied petrology, without which much of the recent work cannot be appreciated.

When Miall refused the Professorship of Geology, the Council of the Yorkshire Collège still wished to secure him upon its staff, and appointed him the following year (1875) lecturer in Biology, a post which he held concurrently with his curatorship of the Museum. In 1876 he was made Professor of Biology. Many of his lectures were given in the library of the Philosophical Society, for the Yorkshire College had little accommodation, while there was room and a store of material at the Museum. The professors of the Yorkshire College frequently gave lectures to the Philosophical Society and sat on its Council. Both institutions worked in conjunction with the Leeds School of Medicine, which required courses of Botany and Zoology for its students.

It was in the yard of the Medical School that Miall dissected the Indian elephant which chance gave into his hands. A shed was built over the animal, and there he worked through the cold winter of 1874-5, helped by F. Greenwood, Curator of the Medical School. The memoir on the "Anatomy of the Indian Elephant" appeared in 1879, and was the second of a series of studies in comparative anatomy. The first of the series was the "Skull of the Crocodile," which appeared in 1878, and the third was the "Structure and Life-History of the Cockroach" (1886). There the series ended abruptly, for though a short account of *Megalichthys*, a ganoid fish of the Coal Measures, was published in 1885, the fourth book of the series, which was to have dealt with that topic, was never written. The author had given so much time to the Cockroach, and had become so deeply interested in it, that all other research had to give way to the structure and life-histories of insects, which occupied him as long as he had vigour and eyesight for the work.

The book on the Cockroach, published in conjunction with Alfred Denny, was by far the most important piece of work that Miall had done so far. It represented several years of study, begun in the Museum of the Philosophical Society, and carried on at the Yorkshire College and at his own home. It has since been recognised as marking an epoch in the study of insects in this country. In reading up the subject as a preliminary to further research, he had become acquainted with the work of the old naturalists, Malpighi, Swammerdam, Lyonnet and Straus-Durchein. He found them so fascinating that the first chapter in the "Cockroach" is devoted to them, and the whole book is an exposition of their teaching—a very lucid account of insect structure and development. Its value was immediately recognised by Prof. Huxley who congratulated Miall on the book.

The "Cockroach" appeared in 1886. In 1887 we find its author already

occupied with another insect, Chironomus, the Harlequin Fly. This was chosen because of its abundance nearly all through the year, its transparency (in contrast to the Cockroach), and the ease with which it can be reared. Besides which, he says, Chironomus, in its various stages, has a very special biological interest. His attention was concentrated upon it for several years. The "Structure and Life-History of the Harlequin Fly," by Miall and A. R. Hammond, did not appear till 1900, though most of the work was done by 1892.

Soon after he began work on Chironomus, Miall visited Leyden to consult some books there. Every letter of this period has some reference to Chironomus, and we even find him "reading Dutch for the sake of Chironomus"; but, nevertheless, he found time to write on educational topics in the 'Journal of Education' and to devise "Object Lessons from Nature," which appeared in book form in 1891.

Nature-study had not at that time become a universal subject of school teaching, but object lessons were given habitually by many teachers. The "Object Lessons from Nature" were intended to emphasise the value of natural history in furnishing object lessons for children. In 1878, a course of nature object lessons to children had been given at the Museum of the Philosophical Society, under his direction, so that the idea was not a new one to him.

A natural development of this was the Saturday morning class for teachers which was so valuable a feature of the Biological Department for many years. The school-masters and mistresses came at first with the idea of getting up a few object lessons for their schools, but eventually many of them came year after year from love of the work, and were the most enthusiastic students that attended the Department. It was a considerable tax on the energy of the staff, and Miall was fortunate in having the hearty co-operation of all concerned. A further extension of this work with teachers took the form of three summer courses in nature study, given in 1901 and the two following years, at Berwick, Rothbury, and Hexham. Here, again, he had the help of his staff, and all looked back with pleasure on the experience.

The investigation of Chironomus led to that of aquatic insects in general, and, in 1891, Miall gave one of the public lectures to the British Association at Cardiff on "Some Difficulties in the Life of Aquatic Insects," treating specially their means of overcoming the surface tension of water. He also read a paper on floating leaves in connection with the same difficulty. A piece of work on Transformation of Insects, which appeared in "Nature" in 1895, was also a product of the Chironomus investigation, and that year, five years before the book on the Harlequin Fly was ready, Miall completed the "Natural History of Aquatic Insects," a semi-popular book on the subjects that he was studying. As in the "Cockroach," he draws attention to the work of "certain old zoologists—Swammerdam, Réaumur, Lyonnet, and De Geer—who are at present unjustly neglected." "Some passages in this book," he says, "if taken alone and read hastily, may appear to disparage systematic

zoology. This is far from my intention. No one can study the great naturalists of the seventeenth and eighteenth centuries without feeling how seriously their work is impaired by the defective systems of the time. It is not systematic, but aimless work that I deprecate—work that springs from no real curiosity about nature and attempts to answer no scientific questions." The book was illustrated by A. R. Hammond, who collaborated with Miall in the production of the "Harlequin Fly," and made most of the beautiful illustrations for that work also.

In 1892, Miall's many preoccupations obliged him to give up the Curatorship of the Philosophical Society, though he still continued to serve on its council. About this time he left Leeds and went with his wife to live at Ilkley, as their children were all scattered for the moment. He subsequently took a house at Ben Rhydding, where he wrote "Round the Year," a series of nature studies, in some respects the most memorable book that has appeared from his pen. He was by this time 54, and henceforward undertook no new work that involved much close microscopic investigation, such as he had given to the Cockroach and the Harlequin Fly, but devoted himself rather to general topics of natural history and to educational work. "Round the Year" may almost be regarded as a piece of literature; it has been compared with Gilbert White's Letters and was written in the same spirit, not as work, but as a pleasant relaxation in the twilight of a busy day. It led to the study of Gilbert White, and to the preparation of a new edition of the Natural History of Selborne in conjunction with Dr. W. Warde Fowler. It was followed, in 1904, by another book of the same kind, "House, Garden, and Field," which has not quite the freshness of "Round the Year," and was meant partly to satisfy the teachers who were clamouring for more object lessons. The author thought it would be better if they made their own lessons, and that nature study could not be taught effectively by those who lacked time or inclination to do so, but he was quite willing to suggest topics for those who cared to develop them.

In 1897 appeared "Thirty Years of Teaching," which embodies his experience in various kinds of teaching, including the education of his own children. A good deal of it had been printed in the "Journal of Education," and was written in the train going to and from Leeds. The most important feature of the book is the method of treating University or College students which it advocates—a method not indeed new, except as applied to them.

When the British Association met in Toronto in 1896, Miall was President of Section D. His address to the section was an eloquent plea for studying *life*, the modes of growth of individuals and races, the causes of decay and extinction, and the adaptation of living organisms to their surroundings. "The animals set before the young zoologist are all dead; it is much if they are not pickled as well," he complains, and he asks why we study animals at all, giving various answers to the question, but ending "to know more of life is an aim as nearly ultimate and self-explanatory as any purpose that man can entertain." Furthermore he urges the historical method of treating various

biological subjects, and shows how much keener interest can be aroused in such a topic as the Alternation of Generations by finding out step by step how it was discovered, and sharing the discoverer's own enthusiasm, than by taking it as a mass of cut-and-dried facts.

After spending half a dozen very pleasant years at Ben Rhydding, Miall moved back to Leeds, partly for the convenience of the two sons who were then at home again, and he remained in Headingley till he gave up his Professorship in 1907. The last years in Leeds were much occupied with methods of teaching, and he now attended the new Education Section of the British Association when he happened to be present at the meetings. In 1903 he was chairman of a committee to report on the teaching of Botany.

In 1902 appeared a volume on "Injurious and Useful Insects," an excursion into economic entomology, which he felt to be an important field of investigation, needing especially complete life-histories of insects to make it valuable. No doubt the main idea was right and has since been followed up with good results, but Miall was not himself in close enough touch with agriculture to make the book altogether a success, from the economic point of view. The life-histories of insects that it contains are, however, still useful to economic entomologists.

At the inauguration of the University of Leeds in 1904, Miall was given the Honorary Degree of D.Sc., the only academic distinction that he ever attained. That year and the year following he had the honour of holding the Fullerian Professorship at the Royal Institution. At that time also he was asked to serve on the Council of the Royal Society, but unwillingly declined as he had already so much on hand.

In 1908, after his retirement to Letchworth, he was President of the Education Section at the British Association in Dublin, and that was the last meeting that he was able to attend, on account of increasing deafness. Many activities had to be given up for the same reason, but he was still able to carry on individual teaching. From his wife, who was as keen an educationist as himself, he had learnt the direct method of teaching modern languages and applied it in a way of his own to the teaching of Latin, writing out a series of oral lessons and learning, when over seventy, to speak Latin fluently with the modern pronunciation. Since his school days, he had never altogether neglected his classical studies and, though he sold most of his books when he left Leeds, he had kept such Latin and Greek authors as he happened to possess.

It might be noted here that all his life he loved books and was interested in the care and binding of them. He was for many years Hon. Librarian of the Yorkshire College. The only half-disparaging remark he was known to make about Charles Darwin referred to the ruthless way he treated books.

Writing was an occupation that he maintained to the end of his life. The first book that he wrote at Letchworth was the "History of Biology," a clear and illuminating résumé of the subject that led to the more important work on the "Early Naturalists (1530-1789)." It begins with an intro-

ductory chapter on Natural History down to the 16th century, and consists mostly of biographical sketches of the old naturalists he loved so well, but there are also digressions on "The Natural History of Other Lands and the Investigation of the Puss Moth and of the Flower." Of this book Dr. Warde Fowler remarks: "He fairly astonished me, after a visit here at Kingham, by sending me as a gift the five splendid volumes on insects of Réaumur, and later on his own book on the 'Early Naturalists,' one as great a treasure as the other, for his own beautiful English was as clear and enjoyable as Réaumur's French."

Miall's great force lay in his absolute sincerity. Though he could write well, and even brilliantly, he never wrote for effect. Everything that he published represented all the careful research and investigation that the subject demanded. His first attempts at solving a problem were usually wrong, he tells us, and in regard to one of his later books he says that every time he looked up a fact in the British Museum, he found two fresh ones that required investigation. "Fortunately," he adds, "I am not pressed for time."

"The Early Naturalists" was the last book he published. He spent some years on "A History of Garden Craft" which was ready for publication when the war broke out in 1914, but was then put aside, and after that he wrote no more books. He wrote an occasional paper, carried on a correspondence (sometimes in French) with one of his brothers, and made letter-writing rather a hobby. Gardening had long been a hobby of his and he had given a good deal of attention to the laying out of his new garden at Letchworth.

On the death of his wife in 1918, my father came back to his favourite haunts in Ben Rhydding and remained there till his last illness. He died on February 21st, 1921, at our house in Leeds. By his own wish there was no religious service at his funeral, a few words of farewell being spoken by his friend, Prof. Smithells, in the presence of a small gathering of relatives, old friends and colleagues. Nevertheless, the religious enthusiasm which inspired his early manhood had never altogether left him, his attitude to life and the unknown was always reverent, and the influence he exerted on those among whom he worked was spiritual as well as intellectual.

W. W.
