

GENERAL SIR ALEX TAYLOR  
G.C.B., R.E.: HIS TIMES, HIS  
FRIENDS, AND HIS WORK

BY HIS DAUGHTER

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## CHAPTER XXIV

### COOPERS HILL

ON arrival in England Sir Alex settled temporarily with his family in London, where he found many an old friend known under very different conditions—Lord Napier, Sir Robert Montgomery, Sir Henry Yule, Sir Richard Temple, and others—in whose friendship he found needed consolation; for though he put a brave face on it, he was, undeniably, very miserable. His life-work had been suddenly arrested while in full activity, and the shock had been great. His training had been Indian exclusively; it would be difficult, he knew, to find occupation in England which would be complementary to his work in the past. Had he worked through his time of office as Secretary to Government in the Public Works Department he would probably have become on retirement a Member of the Council of India in England; but this was now out of the question. He was not in sympathy with English public life; its democratic setting was exceedingly distasteful to him, and it is doubtful whether he could ever have submitted to its conditions. His heart was heavy, therefore; and, in proportion to its heaviness was the relief with which he entered on the last phase of his public service, the Presidency of the Royal Indian Engineering College, Coopers Hill, which was offered to him in 1880; a position for which he was peculiarly fitted both by his

personality, which was exceedingly attractive to young men, and by his long connection with Indian Public Works.

The early history of the College is interesting; it had its roots in conditions obtaining in India at the time of its foundation and previously.

As the Western man—whose ideal of civilisation is based on the exploitation of the material resources of the country he inhabits—got a closer and closer grip of India, the demands on the Department dealing with Public Works naturally increased. Roads and canals on an imposing scale had been made and were still in process of construction; but the mid-Victorian era had seen the inauguration and rapid expansion of swifter means of transport. Railways in India date from 1853. Their construction was at first largely entrusted to subsidised Companies. This arrangement proved costly and otherwise unsatisfactory, and in 1870 the Government of India adopted the policy of constructing and working all railways through the direct agency of the State—an immense accession to its duties.

It was evident, also, that the Irrigation works of the future would be on a constantly increasing scale. India contains large desert-areas, arid because waterless; and also mighty rivers, which pour millions of cubic feet of water per second into the sea, water which, if applied to purposes of irrigation, would make the desert bloom like a garden. It was felt that this waste was a slur on the domestic economy of the country, and that the future of canal-making was endless. With the commercial development of the country and the growth of great trading centres came the necessity for rapid exchange of information. The burden of work laid on the Telegraph Department became very great. Famines had been scourges before which administrators trembled; it was clear that

the construction of the above public utilities would be a profitable mode of both famine-relief and famine-prevention. Evidently, the general trend of progress necessitated the development of a larger and more comprehensive system of Public Works.

Speaking generally, India had been conquered—little by little—by the British army; it was in the nature of things, therefore, that the first steps in its material development should have been taken by the Engineers on the spot, *i.e.* the Company's Military Engineers; and splendid was the work they had done.

As time went on, however, and public demands increased, it was found necessary to supplement the services of the Royal (Bengal) Engineers by those of Civil Engineers proper. In 1858 Lord Stanley<sup>1</sup>—who had carried the Bill for the transference of the Government of India from the hands of the E. I. Company to those of the Crown, and was then the first Secretary of State for India—founded a service of Indian Engineers called Stanley Engineers after their founder. It was composed of men who had passed the test of examinations, and had worked for four years in the offices and workshops of great civil engineers at home. It soon appeared that the equipment of these recruits was very unequal—some were men of trained ability, who have since risen to the highest posts in the Department, but others were not on the same professional level, and it became only too clear that a man might have passed a qualifying examination—especially if judiciously crammed—without becoming either a good engineer or a desirable member of a great Public Department.

There was, moreover, a difficulty in getting sufficient recruits, for it was no easy matter for a young English Engineer to get an adequate training in those days. Before

<sup>1</sup> Afterwards 15th Earl of Derby (1826-1893).

1872 there was no Engineering College in England, though Engineering Departments had been attached to a few Colleges. There were Chairs of Engineering at Glasgow and Edinburgh; a good school, for that date, at Dublin; Engineering classes at Cork and Galway; and a very recently founded Engineering Department at Owens College, Manchester;<sup>1</sup> these were all in their infancy, and none had what would now be regarded as a reasonable Staff or suitable equipment. In short, there was a deficiency of trained recruits, this deficit being largely due to the absence of an Institution in which they might be educated.

These circumstances gave rise to a growing wish for the foundation of an Engineering College in England, which would stand to the members of the Public Works Department in the relation formerly held by Haileybury to the members of the Civil Service, and by Woolwich and Chatham to the Royal Engineers and Artillerymen, and the certificated output of which would be men who had received a uniform training on lines determined by experts, and had been welded into corporate unity by common education and common associations before their arrival in India.

The establishment of such a College was favourably discussed at the India Office under the ægis of the Duke of Argyll (Secretary of State for India 1868-74); and, in 1869, a proposal was drafted and submitted to the Viceroy and Members of Council in India. It was, however, most unfavourably received at a meeting convened for its consideration at Simla. Evidently, the existence of the proposed College—valuable as it might prove to the Public Works Department—was prejudicial to various established interests. Many were the points of view of its

<sup>1</sup> Engineering Departments were opened at University College and King's College (London) in 1872. The first Engineering Laboratory in England was established at University College in 1878.

enemies. Lord Mayo urged the case of the Universities and educational establishments of Great Britain which had already established Chairs of Engineering, advocating the policy of supporting existing institutions rather than that of starting new ones, *ab initio*. Others objected to the creation of a new privileged service at a time when the democratic spirit demanded the extinction of privilege; while others again—exponents of a less modern phase of thought—stood aghast at the prospect of an absolute divorce between power and patronage. “Why,” cried one of these, “if every service is to be entered by competitive examination, we shall soon have Lieutenant Governors without an appointment in their gift!” Neither was it in the nature of things that the Royal Engineers should give enthusiastic support to a scheme, the realisation of which would tend to force them out of a Department in which they had done such honourable service in the past.

Colonel George Chesney, R.E.—an officer of statesman-like intelligence, untiring energy, and great administrative power, who had already taken a leading part in this movement—had been asked to undertake the initiation and organisation of the proposed College, should the Duke of Argyll’s project be put into effect. He was present at this meeting, and marshalled the arguments in favour of the scheme at some length, but, he feared, with little effect. “I expected criticism, or only cold support,” he notes in his diary, “but not the determined opposition I encountered. It is hardly likely that the India Office will persist in the teeth of the Government of India, especially as I hear that the Council was not unanimous.” It was his opinion, evidently, that the proposal was doomed; in this he was mistaken, however: his advocacy carried the day. He was informed next morning that the Council of India had signified its approval both of the India Office

scheme and of his appointment as first President of the proposed Institution.

Surprised and pleased, he started immediately for England, under the impression that the battle had been won, and that he could enter straightway on to the field of his labours. An error: what had been carried was but an outpost; the battle was still to be fought. He found the protagonists of threatened British interests drawn up in phalanx.

Foremost amongst these was Mr Fawcett, the Postmaster-General, whose interest in Indian affairs had earned him the sobriquet of "Member for India," and who, with his usual chivalrous regard for the weak, had taken the Indian ryot under his wing. He protested against the iniquity of forcing Indians to pay for the education of the English Engineer destined to develop lands which were theirs by right of birth, and espoused the cause of existing Chairs and Colleges, to the prospects of which the proposed College could not fail to be prejudicial.

Associated with him was Lord Stanley, now Lord Derby and Lord Rector of the University of Glasgow, who was eloquent in defence of the Institution he represented; his eloquence was discredited, however, by a paper in which Colonel Chesney showed that that University had provided India with three successful Engineers during the course of nine years, an output which hardly justified the sacrifice of a great Indian Department to its preservation.

Mr Gladstone also was hostile, and this, like Mr Fawcett, in the supposed interest of the poor Indian taxpayer—the individual who would profit most from a thoroughly efficient Public Works Department.

In spite of much organised opposition, however, the Duke of Argyll stood stoutly to his colours.

While the Olympians were engaged on deciding whether

they would allow the College to come into existence or not, Colonel Chesney looked for its site; studied the organisation of English Universities—a task in which he was privileged to have the guidance and help of Mr Talbot,<sup>1</sup> then Warden of Keble—and prepared himself for the difficult task of forming the Staff on which the success of the College of the future would ultimately depend.

The housing of the Institution proved a considerable difficulty: many were the orphanages, lunatic asylums, and big hotels—among the latter, the Star and Garter, Richmond—which George Chesney visited in the hope that their inhabitants would vacate in his favour should the shells they occupied prove suitable to his purpose. Months passed, however, and the desired site was yet to find. On a hot August day, however, when boating down the Thames, he saw a large building crest the wooded ridge overhanging the classic reaches which connect old Windsor with Runnymede; he was told that this was Coopers Hill, a palatial country-house built by the financier, Baron Albert Grant, and then for sale. He landed immediately, visited the place, and decided then and there that this was the ideal site for the College of the future.

Meanwhile, he saw to his dismay that matters had taken a very unfavourable turn in high places; how unfavourable is shown by the following entries in his diary:—

“August 15th (1871). Lord Lansdowne’s Committee have written to propose that the College-project be suspended.

“August 22nd. The Duke fears that opposition will be too great. He has sent Fawcett’s letter to Mr Gladstone, who expresses doubts and fears:—1st, of the Royal Engineers, 2nd, of the Civil Engineers, and 3rd, of the Schools and Colleges.

<sup>1</sup> The present Bishop of Winchester.

"August 29th. Bubble burst. After writing numerous letters to tell people that the Prospectus will soon be out, I hear, on going into B's rooms, that all is stopped.

"The Duke has heard from Lord Halifax, and is afraid that he will not get the support of Cabinet, and so must stop!

"August 30th. Write to people to say that College is 'off.'"

But the sky soon brightened.

On September 29th he writes :—"Attack on College by Mr Williamson (Dublin).

"October 24th. Mr Gladstone inveighs against 'tax-supported Institutions.'

"October 26th. Happy surprise; Wyatt<sup>1</sup> strongly advises purchase of Cooper's Hill. Designs rooms."

And finally, on November 7th. "The Duke comes out of the Cabinet, and tells me that the Council have sanctioned his going on with the College."

Eagerly availing himself of this unexpectedly happy turn of events, George Chesney bent himself to his task with such energy that in less than ten months the great architectural changes incident on the transformation of a large country-house into a great educational establishment were roughly complete: a new wing had been built, a fine Staff collected, a curriculum established, students got together, and the big building furnished, provided with servants, etc. On the 5th August 1872, the Duke of Argyll—accompanied by a brilliant assemblage of the past and future rulers of India—opened the College which he had called into being.

The enterprise on which George Chesney had embarked was one of exceeding difficulty. Coopers Hill was an Institution of a new type in this country. Its curriculum, its methods, and its traditions had all to be established. Its

<sup>1</sup> Sir Digby Wyatt, Architect.

Staff had no experience in dealing with the special educational problems which they had been set to solve, and the range and scope of the proper theoretical training for Engineers had not then been studied. Its President, moreover, aimed not only at creating a body of highly-trained Engineers to serve as a stout arm of the Public Service, but at evoking the soul which would be its true *esprit de corps*. Without energy and ability no work is possible. George Chesney looked for energy and ability; but he looked for finer things—for disinterested service, for patriotism, and for pride of race, with its corollary, *noblesse oblige*.

Knowing the power of a name and great traditions to keep men loyal to their true selves, he took pains to bring the Corps of the future, with its traditions to make, into line with his own Corps, with its long and honourable history of self-devotion. He wished the Coopers Hill men in India to be called "Royal Indian Engineers," not "Civil Engineers," a colourless word, descriptive of a profession rather than of an organism. This wish was not wholly realised; Coopers Hill men did not write R.I.E. after their names as he had hoped. His College, however, was called the Royal Indian Engineering College; and the name may be taken as a symbol of the ideal he was endeavouring to make a reality: a civil pendant to the Corps of Royal Engineers; *i.e.* a body of men—gentlemen of God's making and man's—whose lives were dedicated to service in a great Eastern Empire, the inhabitants of which look to Englishmen not only for intelligence, but for character—integrity, chivalry, and a delicate sense of personal honour.

It was from this point of view, as well as from that of intellectual efficiency, that he selected his Staff. His selection justified itself. Seldom has a group of learned men

set their disciples purer examples of disinterested ability. A man of versatile intelligence and wide intellectual sympathies—a soldier who read his classics in the original, and was familiar with modern continental literature; a lover of pictures and music, and deeply interested in the latest phases of science and sociology—George Chesney's relations to these men of his choice were of the happiest, and quite untainted by any trace of militarism, the curse of educational Institutions with soldiers at their head. He never thought of his Professors as subordinates, but as colleagues, expert fellow-workers in a common cause; and in return they gave him that loyal and heartfelt admiration which men give only to those who enter intelligently and sympathetically into their intellectual lives. His power of work, thoroughness, and devotion to duty were exceptional. For instance: during his Presidency he submitted himself to a regular and systematic study of Mechanics, Calculus, and Analytic Geometry, in order to be in a position to judge of the character of the mathematical work done in the College. Each day he submitted his list of questions and examples to his Professor—questions which he had succeeded in solving either wholly or partially, and questions in which he had failed—and this practically throughout his Presidency. To these mathematical studies he added that of German, in which he desired to be more proficient.

His most effective collaborator in the difficult task of spiritualising a material undertaking was his wife. Clever, intuitive, with a genius for admiration, she not only understood but loved the qualities of the scholars for whom she kept open house, and befriended them in the most homely fashions during the long period of acute discomfort necessarily attendant on the occupation of a house under process of organic transformation. Her large party of little boys and girls, moreover, were attractive items in the lives of her

men of science. But the Professors were not the only recipients of her sympathetic affection ; her heart went out to the clever and inexperienced lads—they called themselves "men"—whom her husband was training, and who, with the happy instinctive confidence of youth, entrusted her with the full tale of their callow ideals, and were sent on their way strengthened and comforted, as many a man now in high position in India will remember.

Such was the beginning of Coopers Hill. Never, perhaps, was institution launched and kept afloat in a more unworldly and patriotic spirit.

The burden of organisation, teaching, and government lying on George Chesney's shoulders was at first very heavy ; but as the machine was gradually perfected and began to function automatically, his work grew lighter ; he was able to hunt regularly ; his active brain flowered into a novel, *The Dilemma*, less brilliant, but still a worthy successor to his inimitable *Battle of Dorking*, the progenitor of numerous imitations ; and finally—eight years after the opening of the College, years during which it had established itself on such wide foundations as to stand four-square to all the winds that blow, a proved success—he was summoned to India in 1880 as Military Secretary to the Government of India, becoming a member of the Governor-General's Council in 1886.

Before leaving he was asked if he could recommend a successor. This question remained unanswered for some months ; the Institution was entering on troubled waters—that he knew—and would need a good head and firm hand at the wheel ; he was also anxious to find someone who saw eye to eye with himself in essentials, and would cherish the simple public-spirit which was the keynote of the social fabric he had raised. He heard one day that Alex Taylor had suddenly retired. The two officers had served

together at Delhi, but their paths had lain apart since then. The possibility of Sir Alex's accepting the vacant post flashed through his mind, and he wrote at once to make the suggestion, following up his note by a visit. Before paying this call he spoke of his idea to a friend; the latter shook his head dubiously. "Too old," he said, "too old—hasn't got the physical energy"; and Chesney remembered with a shock that more than two decades had slipped by since those Delhi days.

On approaching an eminence in the neighbourhood of Surbiton where Sir Alex was staying, he saw a stalwart figure and two smaller ones speeding down the slope, each perched on the summit of one of those alarmingly tall and slender wheels which preceded the modern cycle. Suddenly the largest of these machines shot forward, and, gathering momentum on its downward course, dashed past: a flash of spokes, and a cry—"Field! field!" As no one was foolhardy enough to obey this adjuration, the rider steered for a crossway hedge, breasted it, parted company with his machine, and landed gracefully on the other side. This was Taylor, who was being initiated by his boys into the art of bicycling. The episode lasted a moment only, but long enough to settle the question of "physical energy."

Sir Alex declined the proposed appointment, however. He was a soldier and a man of action—"I am no schoolmaster; I have no gift that way," he said, as he shook hands with his departing guest. But George Chesney would take no refusal. The more he saw of his old friend the more sure was he that he had found the "very man." He got him to stay at Coopers Hill, arranged that he should be relieved of the duty of lecturing, introduced him to the place and people—to the river, the workshops, the professors, and to the students; describing him to the latter, in an inaugural address, as the man "without whom Delhi would not have been

taken."<sup>1</sup> Gradually the full scope and importance of the work revealed itself, and Sir Alex eventually accepted the responsibility of forming the young men to whom the future would allot rôles similar to those he himself had played for so many years in the civil administration of the Panjab.

November 5th, 1880, saw him and his family established at Coopers Hill, his home for the next sixteen years.

The site of the College was incomparable, both from the point of view of beauty and of historical associations.

The garden was already celebrated in the reign of Charles II., when Denham sang its praise. The eye could range from its ancient cedar-shadowed lawns, gemmed in spring with blazing rhododendrons, across the rounded treetops of Windsor Park, to the romantic castellated home of England's kings; and, beyond the castle again, to the pale shafts of Eton Chapel. Or—if the spectator changed his position—it might sweep across historic Runnymede, the winding Thames, and mile after mile of cloud-flecked meadow-land, to where a spire-crowned hill—Harrow—rises on the far horizon; or—again changing direction—to another eminence, on which a building of fairy-like name, but unromantic associations—the Crystal Palace,—

<sup>1</sup> In a letter written from Peshawar in 1859, by General Pollard, R.E.—then a Captain—to his mother, Mrs Pollard of Castlepollard, West Meath, asking her to show hospitality to his wounded comrade, Alex Taylor, the writer describes his friend as "a man of intense energy never overcome by any difficulty, but always attaining his object by indomitable resolution." "Sir John Lawrence selected him to undertake the Engineering operations at Delhi," he adds, "and although nominally only Second in Command, he was the planner of the siege, which he carried out as he has his every undertaking. Anyone who knows anything about the siege will tell you that it was Nicholson and Taylor who took Delhi." He then goes on to speak of the two officers as "fast friends and kindred spirits," and quotes Nicholson's well-known appreciation of his services. "He is moreover one of the kindest and most agreeable people you could meet, a great sportsman, and delights in every kind of fun—fishing, shooting, hunting—nothing comes amiss to him"; so he concludes.

indistinguishable throughout the day, would blaze like a beacon at sun-down.

In this lovely English setting Sir Alex embarked on his new work, which, though light, needed tact and head, and in which his collaborators were not the men of action trained in the school of large responsibilities and danger to whom he was accustomed, but chiefly men of books, civilians trained in the lecture-room and laboratory.

Hardly in this latter category, however, was his senior Professor, Calcott Reilly, Professor of Engineering, a man in whom exceptional ability and an unbending will were united to the guilelessness of a generous child, and this although his feet were familiar with some of the roughest of the world's ways. He had run away from home as a boy, and, little more than a child, had endured the brutalities of the hard life before the mast of some seventy years ago. As a youth—realising that knowledge is power, and that he was ignorant—he had had the grit to educate himself and to earn his living, simultaneously: to spend his days in the workshop of the Engineer to whom he had articed himself, and the greater parts of his nights in the unaided study of such subjects as Analytic Geometry, Mechanics, and the Calculus. He reaped his reward: ere long his was the voice to which men listened in the discussion at the Institution of Civil Engineers on the practical application of mathematical principles, to him were awarded the Telford Medal and Telford Premium, and in time he came to be regarded in the Profession not only as a high authority on bridge-designing, but as a representative of the purely scientific work of the Engineer.

“His whole soul,” writes a colleague in an appreciation published at the time of his death, “was devoted to the attainment of the best scientific knowledge . . . whether it had a present appearance of practical utility or not.” After

emphasising the essentially idealistic character of his striving, the writer continues: "Every species of human work possesses a purely spiritual element of this kind, which is in reality a condition of human advancement"; adding, "the lesson is one for which there is great need in an Institution like ours, where there is naturally a tendency to limit attention to the utility of the moment." It was as a scientific Engineer that Sir George Chesney persuaded him to become the Chief of his Staff, and—foregoing pecuniary gain—to devote himself to the task of revealing the noblest aspects of their Profession to the future creators of the Public Works of India.

Such was the Engineer; and as the Engineer such was the human being—an idealist. The following trait may be taken as a symbol of the man. His life had been spent in the midst of roaring furnaces, glowing metals, and the smell of oil; he loved grace and peace, and longed for contact with beautiful objects. His taste was distinguished, he could rest content with nothing that was not the best of its kind. Pictures and statuary were beyond his means. He bought books, therefore, things of beauty—Rogers' *Italy* with Turner's engravings, Ruskin's Works with their incomparable illustrations—these and the like filled his shelves; and he wrapped his treasures in covers of the finest tooling, the *ne plus ultra* of the bookbinders' art. There are many to whom his study is still a living memory. It is with emotion that they recall the wide-spreading English prospect commanded by its big curved window, and remember its book-lined walls and the spectacled, shaggy-bearded man in their midst, who handled his treasures with a lover's touch, and sometimes—reluctantly—pressed them on privileged friends.

To the students, his relation was that of a helper; he called their education "spoon-feeding"—as indeed it was,

in comparison with his—but handled the spoon himself, right willingly; while the kindness and hospitality he and his North-country wife lavished on them was unbounded. He had his quaint ways too. For instance: his sense of courtesy impelled him to say “Good morning” to each of his students as they filed into his lecture-room; some, however, were always late, and, as to greet them would be to interrupt the thread of his discourse, he wrote “G. M.” (good morning) on his blackboard, and would point to these cabalistic letters, without suspending his lecture, when the laggards crept in. A lovable man.

A note of very different quality was struck by Professor Wolstonholme, M.A., Sc.D., Professor of Mathematics, Fellow of Christ's College, and sometime Fellow of St John's College, Cambridge; author of *Mathematical Problems*, *Seven Figure Logarithms*, etc.; and one of the most distinguished mathematicians of his day. Kindly, witty, illusive, he drifted through the College practically unknown, even to his colleagues. An omnivorous novel-reader—bad and good, all was grist that came to his mill, but good only were the books which held their places on his shelves, and these he was glad to lend—it was said of him that he knew the names of every race-horse and jockey in England, and of celebrated cup-winners the history unto the third and fourth generation, and this although he never betted and seldom went to a race-meeting—a significant survival of earlier tastes. This paradoxical being was tantalising, for he would sometimes lift the veil behind which he lived, and reveal the delightful conversationalist one had always divined; but, in the minds of most, his was merely a middle-aged, stooping, slippered figure in a straw hat and blazer, who, pipe-in-mouth and eyes-on-book, might be daily seen butting helplessly into the taut tennis-net which seemed forever to impede his passage across the lawn. Enigmatic, unknown,

he flitted with his family from Coopers Hill without a farewell, and not long afterwards slipped out of life, bequeathing his acquaintances a regretful sense of having been daunted into leaving a gold mine unexploited.<sup>1</sup>

Socially illusive, also, was Professor Unwin,<sup>2</sup> Professor of Hydraulic Engineering, son of the well-known Non-conformist, William Unwin, LL.D., of Homerton College. A man of great intellectual power, who has since filled the highest posts in the domain of Scientific Engineering: kind, shy, fastidious, inaccessible, and yet an admirable friend, the fineness of his fibre imposed itself on all, no one showed him any but their best self. It was with real regret that Sir Alex parted with him, after fifteen years' collaboration, in the interest of the London and City Guilds Technical College; and it was with pride that he saw him take his seat on the Council of the greatest Scientific Societies of Britain,<sup>3</sup> and finally fill the seat of the President of the Institute of Civil Engineers.

Professor Unwin was succeeded in 1884 by Professor Hearson, previously Instructor in Applied Mechanics at the Royal Naval College. A man of learning and an experienced teacher, he combined theoretical knowledge with practical ability, and was the holder of the Gold Medal of the Society of Arts given for inventions. Gentle, benevolent, determined, a confirmed optimist and obviously able, his mere presence proclaimed a personality on which one might

<sup>1</sup> Professor Wolstonholme was succeeded by Professor Lodge, M.A., late Faraday Fellow of St John's College, Oxford, and brother of Sir Oliver Lodge.

<sup>2</sup> Professor W. Cawthorpe Unwin, LL.D. (Edinburgh); F.R.S.; M.Inst.C.E.; Hon. Life Member Inst.M.E.; Hon.Memb.Am.Soc.M.E.; Hon.Assoc.R.Inst.B.Architects; Professor Emeritus Central Technical College, City and Guilds of London Institute.

<sup>3</sup> President, Section G, Royal Association 1892. On the Council of the Royal Society. On the Senate of London University. President of the Inst.C.E.

safely build. Sir Alex always felt that his character and professional ability were valuable assets to the College.

To this group of men—who, with the exception of Professor Hearson, belonged to Sir George Chesney's original Staff—two very dissimilar personalities must be added—Professor M<sup>c</sup>Leod and Professor Minchin<sup>1</sup>; the former a chemist of distinction, a Fellow of the Royal Society, a High-Churchman and a Tory, and, in all paths of life, a follower of the most orthodox of the strictest sects of orthodoxy; the latter a whimsical, paradoxical, emotional Celt, a professed disciple of all the unorthodoxies, who admitted no allegiance to any laws save those promulgated by his own fine intelligence and his own generous heart.

A mathematician, physicist, and metaphysician, trained at Trinity College, Dublin, and gifted with the persuasive speech and imagination of his race—Professor Minchin's Lectures on Applied Mathematics were masterpieces of lucidity. It was, however, in lectures of a very different character—at which the astonished aborigines of the countryside were allowed to assist—that the full flavour of the man revealed itself; the flavour of the race of Mr Bernard Shaw. Treating his raw material—any recent social or political event—in the spirit of a Rabelais or a Swift, he tilted against humbug, unmasked accepted respectabilities, overwhelmed dishonesty with innuendo and invective, pelted it with nicknames born of insight and contempt, bewildered his audience with witty paradox seasoned with laughter, and finally—having tossed the souls of his hearers from surprise to surprise—sent his audience out into the night ejaculating, "How brilliant!" but as bewildered and mystified as if they had been watching a conjurer—to find on awakening next morning that some of their dearest prejudices had been laughed out of court. A true Celt.

<sup>1</sup> Professor Minchin, M.A., F.R.S.

No suggestion of his personality would be complete without reference to his passion for birds. The appeal of that particular blend of delicate beauty, helplessness, and gallantry common to feathered things was irresistible to him. Many were the fledglings, children of misfortune, adopted by him at spring-time, and great their demands on his time and devotion. He was a troublesome guest, who invariably arrived late for dinner—if at all,—but to have kept a bird waiting for its food was a crime which no one could justly lay at his door. As a tutor, he was both protective and indulgent: he gave his “men” that for which they asked, even when it was bad for them, for he held that *experientia docet*; and he intervened strenuously between them and punishment, for, with the constitutional melancholy of his people, he thought life itself a sufficient scourge without artificial aggravation. If it be added that he had a pretty gift of caustic humour and was an admirable tennis-player, it will be understood that he was popular.

This, however, was his holiday side—recreation. A constant and ardent devotee of Scientific Research, his life in the main was spent in the laboratory, that austere workshop which may at any moment become a presence-chamber in which the worker suddenly finds himself confronted with an august and hitherto unknown verity. The subjects he pursued were after his own heart. In the Coopers Hill Laboratory he made the first electrical measurements of the light of the fixed stars and planets by means of an invention of his own—the photo-electric selenium cell. These tiny cells have the extraordinary property of generating electric currents under the action of incident light—the practical interest of this fact being the far-away possibility that the rays of the tropical sun may be seized some day, imprisoned, and utilised.

In addition to these cells he constructed others which

not only respond to light, but have a further romantic property—they get tired and cease to act, but revive and continue to generate electricity under the stimulus of the impact of vibrations so subtle that they can be set up and conveyed by the utterance of words. Not every word is effective, and not every tone; both must be right. It is intelligible that the romance of this discovery was not left unexploited by this fantastic Irishman. Professor Minchin—like Edgar Allan Poe interrogating the Raven for news of his lost Lenore—would play on his cell with vocables of which the result was a foregone conclusion. It needed masterful management: of caressing, wheedling tones it took no notice, but to a man standing at a suitable distance, with his face turned towards it, uttering words of power—words with strongly-marked labials and gutturals—its response was immediate. It was an experience in Wonderland to stand in that dim bare room, with its stone tables and delicate scientific apparatus, while the Professor—white-haired though young, collarless, and wearing an old College blazer—pleaded and coaxed uselessly in the darkness, then suddenly, raising his voice in terrific adjuration, thundered: “Hear my voice, O Balaam, hearken unto me, thou son of Zip-por!” No notice was taken of any sound until “por” was pronounced; then came the response—the deflection of a needle. This impulsion cell was the first “coherer,” or receiver, of wireless signals sent from a distance by Hertz waves, and is identical in operation with those now in use.

Professor Minchin also worked on the problem of photo-electricity, with the object of producing photographic images at a distance by means of electric currents, and on the cognate subject of wireless telegraphy. In the course of the latter research he succeeded in receiving electric wireless signals through the walls of the Physical Laboratory

