

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 Stanley¹—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

¹ 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;¹ 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

¹ 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,¹ 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.

¹ 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; Wyatt¹ 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

¹ 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 bicycle-riding. 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."¹ 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,—

¹ 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.¹

Socially illusive, also, was Professor Unwin,² 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,³ 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

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

² 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.

³ 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^cLeod and Professor Minchin¹; 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.

¹ 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

from an induction-coil placed in a cricket-field some yards distant. Unfortunately his experiments were conducted with a horizontal receiving-wire and not with the vertical wire adopted by Marconi, otherwise his wireless signals would undoubtedly have been received at distances measured in miles instead of in yards some four or five years before wireless telegraphy became a commercialised concern.

Such were the Senior Professors inherited from his predecessor by Sir Alex—men of personal charm and disinterested enthusiasms, of whose scientific attainments he and the College were justly proud.

To their number the names of three soldiers must be added, and that of a civilian who was a soldier both at heart and in practice :—Colonel Edgcome, R.E. ; Colonel Courtney, R.E. ; Lieutenant Clarke, R.E. ; and Mr Eagles, B.A.

Colonel Edgcome and Colonel Courtney¹ were in charge of the Survey Department ; the latter—a man of society and a courtier by instinct—presided over the College festivities, balls, sports, and the like, to which he gave a certain cachet which it was important should be imprinted from the outset on the hospitalities and the functions of an Institution which was designed to take the place beside others of older standing. Lieutenant George Clarke—subsequently Governor of Victoria, and afterwards of Bombay, now Lord Sydenham, then Professor of Practical Geometry and Engineering Drawing in the College—was already a marked man ; he had passed first, both into Woolwich and out of it ; on leaving Coopers Hill he distinguished himself in politico-military employ in Egypt, on the Continent, and in America ; and was a leading spirit on the Army Re-organisation Committees and Committees of National Defence.

¹ Major-General Edward Courtney, C.V.O., late Governor of the Military Knights of Windsor.



COOPERS HILL STAFF, 1882.

Prof. Unwin.	Mr Pasco, R.N.	Mr Whiffin, R.N.	Mr Heath.
Prof. Stocker.	Prof. Wolstonholme.	Sir Alex Taylor.	Col. Edgcome.
		Prof. Reilly.	

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His honours reflect his versatility :—G.C.M.G, G.C.I.E., and F.R.S.

Mr Eagles¹ shone among the members of the Professional Staff as a man of action, and of pleasure too, in the best sense of the word. Endowed with a keen intelligence and exceptional mathematical ability, his blunt common-sense, high principles, and *joie de vivre*, made him an effective influence for good among the students, with whose holiday-life he identified himself. He commanded the Coopers Hill Company of the Berkshire Volunteers, was one of the best shots in the College Rifle Team, was the life and soul of the College Boating Club and coached the College fours and eights. His hospitality was unbounded, and his company of the best. He died twenty-one years ago (1892); but the hearts of many friends still soften when they think of "Tommy Eagles," with his generous heart, his strong ready helping hand, his open purse, his laugh, his song, his racy tongue, and his untarnished honour.²

Of the students more need not be said than that in 1880 they were 130 strong, clean-limbed, upright young men—some abler than others,—whose interest in Applied Mechanics and the Calculus was less apparent than their pleasure in football and boating, but whose after records show that they were more intimate with the former than they then cared to acknowledge. Prominent among those who have since risen to eminence in their profession are :—Sir T. R. Wynne, K.C.I.E., now President of the Railway

¹ T. E. Eagles, M.A. (Queen's College, Cambridge), Instructor at Coopers Hill in Architectural and Geometrical Drawing. Publications :—*Constructive Geometry of Plane Surfaces*; *Descriptive Geometry*; etc.

² Other members of Sir George Chesney's Staff :—Instructor of Descriptive Engineering, Mr Heath; Secretary, Mr Whiffin, R.N.; Bursar, Mr Pasco, R.N., grandson of the Lieutenant Pasco who signalled "England expects every man to do his duty"; Chaplain, the Rev. Charles Crosleigh, D.D.

Board of India ; Sir Lionel Jacob, K.C.S.I., who served for twenty-eight years in the Panjab Irrigation Works, during which he carried through the great Chenab canal-projects ; he was afterwards Chief Engineer of Burma, then Inspector-General of Irrigation and Secretary in the Public Works Department, and finally, Secretary in the Public Works Department for all its branches ; and Sir John Benton, K.C.I.E., Fellow of Coopers Hill College—described by Dr Unwin at a public dinner as “the greatest Irrigation engineer India has ever had,”—who has performed the almost unimaginable feat of carrying the Lower Bari Doab Canal—a volume of water ten times greater than that of the Thames at Windsor—across the Ravi, a river which at flood-time has a width of from one to three miles—a Work which will convert 1,650,000 acres of desert into a fertile land supporting a teeming and prosperous population, and is expected to yield a revenue of 39 lakhs of rupees yearly (£260,000). Beside these there are many others, who, though less fortunate in obtaining official recognition, have done brilliant and honoured work in the Department.

When Sir George Chesney persuaded Sir Alex Taylor to undertake the Presidency of Coopers Hill he knew that the College was embarking on a crucial phase of its existence, When it was founded in 1870-71, the Government of India informed the Secretary of State in Council that the number of recruits needed by the Public Works Department would be from forty to fifty yearly, and it held to this figure, although reminded that such an annual accession was far in excess of the vacancies then occurring in a Service the total strength of which was some 1000 men, including both Royal and Civil Engineers. In obedience to these instructions—which seemed to show that the Government had great Indian Public Works in view—and to the decision

that the proposed College-course should cover three years, Sir George Chesney organised the College on a scale which permitted the maintenance and education of a maximum of 150 students at a time.

Two circumstances, however, combined to negative this expected Departmental expansion :—the depreciation of the rupee, which seriously hampered Indian finance, and the successful recrudescence of the theory that the construction and administration of railways should be outside the sphere of official control. This opinion was immensely reinforced by the accession to power in England of the Liberal Party, which figured in India as the protector of the rights of private enterprise. In accordance with this theory, said Sir Guilford Molesworth in his Presidential address at the Institution of Civil Engineers (1904) "it was laid down as an axiom by the Secretary of State for India that the Government should divest itself of the task of making railways. This change of policy was carried out, notwithstanding the strong objections that were raised by the expert-advisers to the Government."

The result of the consequent curtailment of the enterprises entrusted to the Public Works Department was a Service overstocked with officers—a block, in short. This misfortune could be met only by reducing the number of recruits accepted, which was gradually done ; in 1880 the College entries had fallen from fifty to twenty men yearly.

Sir Alex, therefore, was confronted with the task of running a College organised to meet the needs of 150 students—and to be financed by their fees¹—on an income of considerably less than half the amount anticipated ; and this for masters who made the financial independence of the Institution a *sine quâ non*. The Government of India had never been sanguine in this direction, even when it

¹ £150 a year, a net income of £22,500 a year.

was asking for fifty men a year ; and, from the outset, had been careful to underline its wishes in the matter. "We shall look," it wrote to the Secretary of State for India, "with great concern on any arrangements that will lead to considerable outlay either on salaries for the educational Staff, or for buildings, which shall not be either fully, or almost entirely, covered by the contributions received from the students. The Institution, in short, would in our judgment be *distinctly condemned if it could not be conducted on what would be an entirely self-supporting basis.*"

The situation in 1880 could be met only by so enlarging the scope of the education given as to attract students other than those to whom Indian appointments had been promised. It was arranged, therefore, that whereas former students had entered by a competitive examination, the passing of which practically secured them an Indian appointment at the end of three years—or rather four, for one year's practical course at some great engineering works was soon added to the years of residence at Coopers Hill—the College would be open in future to all those who passed a qualifying examination ; and that the competitive examinations for Government appointments should not take place until the end of the three years' course,—the appointments themselves partaking of the nature of prizes. Coopers Hill, therefore, no longer existed solely to provide the Government of India with Civil Engineers, though it was the sole source whence that Government might draw them. It had become a training ground for Engineers in general, special attention being paid, however, to the peculiar requirements of India.

This change of policy had the desired effect of increasing the number of entries, but not on a sufficient scale. It was necessary to have recourse to other expedients.

The College was made the training ground for other

Indian Governmental Departments, *i.e.* for the Telegraph and Forest Departments: the former in 1878—that is during Sir George Chesney's régime—the latter in 1885. On several occasions Sir Alex was asked to nominate men from among the Coopers Hill students to his own Corps, and to the Royal Garrison Artillery, the Royal Field Artillery, and the Royal Horse Artillery; more than forty such appointments were made on his recommendation during his Presidency.

Further, a number—rather more than thirty Coopers Hill men—were either posted directly to the Egyptian Public Works Department, or lent to it by the Government of India.

"Egypt is second only to India," writes a highly-placed member of the British Government in Egypt, more than two decades later, "in its indebtedness to Coopers Hill for a body of men in the public service whose professional qualifications, loyalty to their employers, and devotion to duty have set the standard for one of the most important State Departments. The special qualities of enthusiasm, integrity, simplicity of purpose, and *esprit de corps* so characteristic of the College, and so largely due to Sir Alex's influence, are plainly noticeable among Coopers Hill men in Egypt, and though they cannot lay claim to any special share in the most famous of the great Irrigation works in that country, which were mainly designed and executed by an earlier generation, it is largely by them that the magnificent and complicated system of water-distribution, with its innumerable ramifications of minor works, is now carried on, with a self-sacrificing zeal and keen sympathy with the people of the country that is the admiration of all who are in a position to appreciate it."

Amongst the Coopers Hill men of eminence in Egypt who belonged to Sir Alex's time are Sir Arthur Webb,

K.C.M.G., who was closely associated with the building of the famous Assouan Dam, the late J. K. Verschoyle, C.M.G. (Inspector-General of Irrigation), and C. E. Dupuis—from 1909 to 1912 Adviser to the Ministry of Public Works—who was more particularly associated with the earlier studies of the Upper Nile and the institution of a branch of the Egyptian Irrigation service at Khartoum.

Coopers Hill men were also lent in the same way to the Governments of Assam, Burma, Cyprus, and elsewhere, and to Native States—Kashmir, Jodhpur, Rajputana, Kotah, and others.

As time went on, the Coopers Hill education justified itself so amply, and its scholars made themselves so exceedingly desirable a reputation, that its diplomas were an almost sure pass to employment. Many were the applications received by Sir Alex from foreign Governments, more especially from those of South America, and from the Directors of Private Companies—such as the Uganda Railway Works, on which his men were well represented,—they gradually came, moreover, to fill many of the higher positions on the great Indian Railways.

All this involved much time-consuming correspondence. His efforts, however, were so far successful that, from 1887 to 1893, the College was either absolutely self-supporting, or practically so, the deficit being a negligible quantity.

This result was partly due to the following successful commercial enterprise. For many years the large quantities of railway-materials sent to India for the Government railways had been systematically tested in London by various testing laboratories—both in respect to mechanical properties and chemical composition—in order to ensure their efficiency.

As the Mechanical Laboratory possessed a very fine ten-

sile testing-machine, it was suggested that this work might be undertaken by the College at the ordinary fees, and thus not only assist the finances of the College, but be of educational service to the students. This work was commenced under Professor Unwin, and continued with most satisfactory results under Professor Hearson.

Mechanical testing having proved so great a success, it was decided to undertake the chemical analysis of the materials used on the Indian State Railways. A special Chemical Laboratory attached to Professor McLeod's Department was fitted up, and work was commenced in January 1886 under the charge of Mr Arnold Philip, now Chemist to the Admiralty. He was succeeded in 1902 by Mr F. W. Harbord—who had long been occupied in work connected with the testing and analysis of steel and of the various other materials used by Railway Companies—under whose able and energetic guidance the work increased so greatly that considerable additions to the Laboratory had to be built and the Staff largely augmented. The profits derived from the Mechanical and Chemical Testing Laboratories were considerable; they averaged £1200 a year for a number of years, and, owing to the great increase of work, afterwards considerably exceeded this figure.

The School of Forestry, on the other hand, far from being a financial aid, was—at first—an additional expense; to the College only, be it understood, not to the Government of India, which it supplied with competent Forest officers—an abundant source of future revenue. To the College, however, was debited the cost of constructing necessary buildings—museum, lecture-rooms, etc.—and of financing the Staff of experts needed to do justice to special subject-matter. These expenses were heavy and the number of entries small—five during the first year—a number, however, which rose in time to forty-three. Its Director never doubted

its eventual financial success ; though the feat of paying its way is not one usually required of an educational establishment—the Colleges of Oxford, Cambridge, London, Edinburgh and Glasgow are either richly endowed or partially supported by rates.

The establishment of a School of Forestry at Coopers Hill is hardly intelligible without a glance at the history of forestry in India.

The importance of forestry to a continent ill-provided with coal, and therefore dependent on its woodlands for fuel and building-materials, was obvious to the Government of India ; attempts to organise a Department entrusted with its care had, however, been intermittent and ineffectual. The annexation of Pegu (1852), with its immense teak-woods, brought the question to the front.

Lord Dalhousie—determining that so great a source of revenue should not be recklessly exploited by traders, but should enrich the public treasury—placed these forests under the control of officials ; with unsatisfactory results, however. What he wanted was a trained Conservator of Forests, but no such Englishman existed ; for England—with her ample rainfall, her coal-mines which supplied her with fuel, and her ships which put the forests of other countries at her disposal—had not been forced by necessity to make a special study of woodcraft. Lamenting the quandary at a dinner-party at Government House, he exclaimed : “ Could I but find the man ! ” Lady Havelock—*cherchez la femme*—who was sitting next to him, replied—“ Perhaps I can help you. My sister¹ has married a German Professor of Botany at Bonn, Dr Dietrich Brandis ; he is able, clever, energetic. I know him, and I believe that he is just what you want.” Lord Dalhousie was aware that Germany—having little coal and

¹ Lady Havelock and Frau Brandis were daughters of the celebrated Indian missionary and historian, Dr Marshman.

a relatively small seaboard, and being dependent therefore on home-produce for fuel and timber—had splendid Schools of Forestry, and pursued the clue. Report and his University spoke golden things of Lady Havelock's brother-in-law, and to him the post of Superintendent of the Pegu Teak Forests was eventually offered, to the delight of the young *privat docent*.

Dr Dietrich Brandis arrived in India early in 1856, bubbling over with enthusiasm and plans. Lord Dalhousie was delighted with him—"If you realise an eighth of your proposals, you will do well!" he said, and shipped him off to Burma; his belongings following in a later ship. The latter was wrecked, and his books and herbarium sent to the bottom of the sea, a misfortune which he interpreted as an intimation that Forestry should replace Botany in his life, and, though he could have wished that the form of the communication had been less peremptory, he accepted it loyally. Indeed, the task he had undertaken needed a single eye—it was immense. Grappling with it immediately, he provided himself with tents and servants, and disappeared on a solitary tour of inspection of his tropical charge—a virgin-forest some 70,000 square miles in extent—work which had to be done either on horseback, or on foot, in a hot, moist atmosphere dancing with stinging insects. Eight months later—having taken a bird's-eye view of his domain, and decided on his methods—he reappeared in civilisation; and immediately embarked on a campaign against British timber-merchants, who—declaring that the supply of teak-timber from the forests was inexhaustible—insisted on their right to treat it as common property, like air or water. He carried the day, after a battle-royal which lasted some years, during which he was strenuously supported by Col. Phayre,¹ Commissioner of Pegu, and Captain Henry Yule, R.E., who

¹ Sir Arthur Phayre.

had been Secretary to the British Mission to Ava in 1855. Were the British Empire indebted to its German Forest-Conservator for nothing but the salvation of the teak-forests of Burma, its obligation would still be heavy.

In 1857—a year after his arrival in the East—the forests of Burma were placed under his control, and in 1864 the woods of India came under his sway: he was appointed first British Inspector-General of Forests. With his usual energy, he immediately set to work to inaugurate systematic forest-management on scientific principles:—a regular Department was created and a forest law passed. The latter provided for the demarcation and control of State forests which cover an area of 239,000 square miles, or one-fourth of the whole of British India. A gigantic task. So far he had worked with a Staff of such imperfectly-trained assistants as the Indian Government could provide; he now felt the need of expert help, and for this he turned—*per forza*, for there was still no School of Forestry in England—to his native land, from which he drew one of the great Professor Heyer's most brilliant disciples, Dr William Schlich, and also Mr B. Ribbentrop, both of whom have splendidly justified his choice, being first his able adjutants, and then his worthy successors. The practical result of their common work is suggested by the following figures. The net revenue yielded by Indian forests in 1864 was £40,000; in 1904 this figure had risen to £660,000; to which must be added produce which is valued at a very large figure and given gratuitously to the natives every year.

Quite phenomenal were both the quantity and the quality of the work accomplished by this founder and organiser of the Department of Indian Forestry. He lived for it, and expected others to do the same; and though some complained of the strain put on them, he was seldom disappointed, for his ardour was infectious. His constitution

was of iron, and he strained it to the utmost; no eight-hours working-day for him—sixteen was his allowance, meals being regarded as negligible interruptions. A strenuous worker, an ardent devotee of his profession, a protector of the natives of India—to whose needs and rights, to whose prejudices even, he was very sensitive—Sir Dietrich Brandis¹ has left an honoured name in a country which he never adopted as his own, but for which he did unique and memorable service.

When—after years of varied experience in Burma, Sind, Bengal, and the Panjab—Dr Schlich succeeded his compatriot as head of the Department, he inherited a field of labour which had been plotted out by a man of genius, but was in a state of imperfect development. Fortunately, the needed work of expansion and re-organisation demanded qualities which the new Inspector-General possessed to a remarkable degree—tact, determination, the capacity for persistent and unostentatious work, and the power of forming calm and wide judgments.

The chief obstacle to progress lay in the absence of expert workers. In 1866, Sir Dietrich Brandis had obtained permission to have a certain number of young Englishmen trained on the Continent,² and in 1878 he had founded a school for the education of the lower grades of forest officials at Dehra Dun, in India. Still, education in Forestry was woefully deficient, and Dr Schlich was strongly of opinion that existing needs could only be met by the foundation of a scientific school for the purpose in England.

Sir Alex Taylor's proposal that such a school should be engrafted on the already existing Royal Engineering College met with approval, and Dr Schlich was deputed by the India Office to found and organise the first faculty of

¹ Sir Dietrich Brandis, K.C.I.E., F.R.S., F.L.S., F.R.G.S., LL.D.

² At Nancy, under the guidance of Colonel Pearson, R.E.

Forestry in Great Britain. With the assistance of Sir Joseph Hooker,¹ then Director of the Botanical Gardens at Kew, and with Sir Alex Taylor's approval, he secured the services of three able and distinguished collaborators—Dr Marshall Ward,² Dr Shipley,³ and Mr Fisher, the latter formerly Director of the School at Dehra Dun. For some time, Sir Dietrich Brandis also took the Coopers Hill men yearly for a three months' tour of instruction through certain scientifically managed forests of France and Germany.

The work thus initiated progressed steadily, and now, thanks to Sir Dietrich Brandis and Sir William Schlich,⁴ the Forest Department of India is for ever independent of foreign assistance. It has its own regular establishment of two hundred highly-trained English specialists, more than 1000 educated native officials, and some 10,000 trained native subordinates. Sir William Schlich's first three pupils at Coopers Hill now control the Department in India.⁵

In view of the fact that the net yearly revenue resulting from Departmental-labours amounted in 1912 to nearly a million sterling, it is hardly decorous of the Indian Government to reckon the few hundred pounds which it may have contributed to the education of its Foresters at Coopers Hill as a *loss*.⁶

No sketch of the Coopers Hill School of Forestry would

¹ Sir Joseph Hooker, C.B., G.C.S.I., M.D., D.C.L., I.L.D., F.R.S., F.L.S.

² Professor Marshall Ward, F.R.S., Hon. D.Sc., F.L.S., Professor of Botany at Cambridge University.

³ Dr Shipley, M.A., Hon. D.Sc., F.Z.S., F.L.S., Master of Christ's College, Cambridge.

⁴ Sir William Schlich, K.C.I.E., F.R.S., Ph.D., F.L.S., etc.

⁵ G. S. Hart, Inspector-General of Forests with the Government of India; C. G. Rogers, Chief Conservator of Forests, Burma; M. Hill, Chief Conservator of Forests, Central Provinces.

⁶ On the closure of the College in 1904, the School of Forestry was removed to Oxford, where, thanks to the tact, tenacity of purpose, enthusiasm, and ready generosity of Sir William Schlich, the Father of Scientific Forestry in Great Britain, its continuance is practically assured.

be complete without a suggestion of the work and personality of the brilliant botanist—Professor Marshall Ward—whose most remarkable work was done during the decade he spent in Surrey.

Forced by circumstances to leave school while still a lad, he determined—nevertheless—to play his part in the world of intellect, and continued to educate himself, frequenting the evening classes organised by the Science and Art Department at South Kensington, where he had the good fortune to work under the most inspiring of teachers—Professor Huxley. The strain of the double life on his health was immense—he sometimes fainted in class—and it is to be feared that his premature death is to be traced to this early period of overwork.

In 1875 he went for a session to Owens College, Manchester, where he carried off the prize for every subject he studied. Next year he won an open scholarship at Christ's College, and took a first class in botany in the Natural Science Tripos in 1879. Henceforth his success was assured. Rising rapidly in his profession, he successively held Bishop Berkeley's Fellowship for Original Research, a Lectureship at Owens College on Vegetable Physiology and Histology, a Fellowship at Christ's College, Cambridge, the Professorship of Botany at Coopers Hill (1884); and finally—eleven years later (1895)—he filled the Chair of Botany at Cambridge, where—at the head of what is considered the best equipped institute in the world—he was evolving a School of Botanists from which great things were expected, when his health suddenly gave way, and he died (1906).

Such was the significant frame-work of a full life, devoted—in spite of material difficulties—to scientific research.

At the beginning of his career he was sent to Ceylon to study the minute local fungi that had attacked the leaves of the coffee-plant, ruined the coffee-planters of the island,

and contributed to the collapse of the Oriental Bank. The evil admitted of no remedy, but Professor Marshall Ward brought the origin and curious life-history of the malignant parasite into the domain of science.

His contributions to knowledge are manifold, and though his mind and work were essentially scientific and unutilitarian, his results were sometimes incidentally of great practical value, more especially in the realm of bacteriology. He proved that exposure to direct sunshine is fatal to bacteria in a fluid medium, the result of his laborious investigations being a modification of the policy regulating the water supply of London.¹ He also discovered that anthrax and typhoid bacilli—which can live in water—are destroyed by light, but more especially by the ultra-violet light-rays, and advised the use of the arc light for purposes of disinfection.

Those discoveries, however, are merely by-products of his work. It is as a scientist that his name will live. Enough has been said to suggest the influence which so luminous an intelligence, so restless a scientific curiosity, and so pertinacious a power of work could not fail to exert on young men entering on a profession of which trees and plants and fungi are the raw material.

It may be added that Professor Marshall Ward was a teacher of extraordinary brilliancy and charm, and a musician by grace of God, of whom it was said that, had he made Music and not Science his profession, he would have risen to equal eminence.

¹ "If we hear nothing now of obtaining water from Wales, it is because we know that even polluted flood-water, if exposed in large reservoirs, will rid itself of its bacterial contamination, partly, as was known already, by subsidence, but most effectually, as was shown by Marshall Ward, by the destruction of its most deleterious constituents by the direct action of sunlight." —"Harry Marshall Ward," by Sir William Thiselton Dyer, in *Makers of British Botany*, edited by F. W. Oliver, Cambridge University Press, 1913 p. 274.

Enough has been said of Sir Alex's efforts to establish the financial independence of the College, and thus to secure it from attacks from quarters accurately forecast in 1870 by Mr Gladstone. It was not work that was congenial to him; it was lightened, however, by the great pleasure he derived from helping young men to get the billet which was to be their start in life.

The formal management of the College gave him little or no trouble. He was accustomed to large undertakings, and therefore to delegating authority to competent subordinates. Having traced its general lines, he naturally left educational details in the hands of the distinguished experts who were his colleagues, and who represented, each in his especial branch, the last word of contemporary knowledge.

But, if he left the technical training of the engineers of the future to his Staff in the well-founded assurance that his confidence was not misplaced, he took a very serious view of his personal responsibility for the character of the officers he was about to send to India as representatives of Christian civilisation. His own personal life was based on religion. The impression made on him in boyhood by the religious atmosphere of Herr von Fellenberg's household was deepened in India by the holy life led by many of his most valued friends—Sir Henry Lawrence, Sir Herbert Edwardes, Sir Robert Montgomery, Colonel Rennell Taylor, and others, who were saints as well as heroes. He believed in the efficacy of prayer; and was convinced that nothing was more conducive to nobility of life than a determined obedience to divine laws and a reverent consciousness of divine assistance. It was his fervent hope that the hearts of many of the men whom he was equipping for public service in India might rest on the foundation which he himself had found so stable; and, though he never addressed them on the

subject, his views were well known, for his life spoke eloquently and in a language none could misunderstand.

"Sir Alex was an intensely religious man," wrote Professor Minchin in after years, "and regarded moral discipline and example as the highest interest of the College. His life was in accordance with his religion, which was a simple system altogether aloof from rites, ceremonies, and ritualistic observances. He belonged to a now almost extinct class of evangelical Protestants. His conscientiousness and strict honesty were the visible expressions of his religion. . . . He attached great importance to regularity in attendance at the College Chapel, and he did so from the best motives. In such a matter we are brought face to face with the effect of compulsion in religious observances. In my opinion the moral value of compulsion is negative, he could not see it in this light, his optimism led him to hope for good effects; and certainly the example set by himself was well calculated to induce good lives in others."

His standard of public life was high; how could it be otherwise, seeing that he had been educated by Herr von Fellenberg and had served with the old Panjab Staff, of the members of which it has been said that they "were not merely hard-working administrators and fine soldiers, but men entirely devoted to the people and their Service."

Looking on his students not only as engineers-in-the-making, but as the future representatives of England in the East, he was anxious that they should go out to India already imbued with a liking for its natives, who are shrewd observers of character and attach more importance to breeding and disinterestedness than to learning. Sincerity, self-sacrifice, courtesy, and straightness—these are the things which the people of India understand, and these it is, and the confidence they inspire, which are the true foundation of British power. "Natives read our characters like a book,

and an easy book too," so wrote one who knew and loved the people he ruled ;¹ it is important, therefore, that the pages of this book should be inscribed with things lovely and of good report, of which we know that it is well for all men that they should think.

The point of view from which Sir Alex viewed the future careers of his students was that of a Statesman rather than of a Civil Engineer ; he looked beyond the handling of bricks and mortar and fire and steel to the man and the nation. His students, aware from the beginning—in the vague, inarticulate way of the young—of the character of their Chief's ideals and whither they tended, are fully aware of their significance now that they too are approaching the journey's end. Looking back on the tale of their own labours, they realise how great to them has been the value of certain words they heard in those old days, and of certain impalpable influences to which they were then subjected. One of them, who has played his part with distinction, writes of the "enormous importance and value of the work done by Sir Alex in the last phase of his active life, and the dominating influence of his character—working through varied personalities of the Professors—on the development of a particularly high and special character in the young men passing through the College." After speaking of the professional attainments of the Coopers Hill men, he adds : "I feel that the wishes and intentions of its founders in the matter of developing a Corps of Civil Engineers with a somewhat special standard of personal character, integrity, and honour, have been realised to a quite remarkable extent, and that this result is unquestionably due in large measure to Sir Alex's example and influence. In view of the life-work of the men leaving the College, I can scarcely conceive an achievement of greater service to the Empire."

¹ General Sir Richard Pollock, K.C.S.I.

Sir Alex was not anxious to turn out a number of ambitious and abnormally-gifted young men, burning to do brilliant work—men looking for applause and kudos he held in absolute abhorrence—he looked rather for the sound worker who would do the dull day's work to the top of his ability, and such, he knew from experience, seldom fail to rise to the height of such opportunities as occur. The *Übermensch* had no place in his scheme; he did not legislate for him, but for what is most needed in great public Departments, viz.—able, normal men, who live and work—on sound lines based on principle and high ideals of public service—regardless of interested clamour and the popularity of early and showy results. Good, solid, reliable work—*esse quam videri*—this was his ideal.

Second only to religion and character did he place the healthy body and the means by which it is kept "fit." An exceptionally hard worker himself, a shoulderer of difficulties, and a lover of danger, he had always been a hard player also. "Sir Alex was ardent in his admiration for manly sports," writes one of his early students—Mr A. T. Mackenzie, now Chief Engineer to the Nizam of Hyderabad—"and a great encourager of such games as demand courage, decision, and self-denial. Rugby¹ football was his preference, and the whole family used to come to the football field on match-days, and get most excited." "I never saw him angry," adds the writer, "or in anything but a sunny temper. I cannot form an idea of what he would be like in anger, though one could see that he was capable of righteous indignation." The latter observation sheds a pleasant light on Mr Mackenzie's College-career, for Sir Alex could be very angry when occasion arose. "He was a strict disciplinarian," writes one of his colleagues, "but

¹ It will be remembered that at Chatham he had been called the Football King.

generally had a strong tendency to take a merciful view of a case ; but, in the event of anything of grave importance taking place, Sir Alex was the very last man any student of Coopers Hill cared to meet."

He attached importance not only to games, as fields in which *esprit de corps*, self-reliance, and chivalry are naturally acquired, but to familiarity with the social amenities. He knew how hard and solitary would be the future lives of many of the joyous laughter-loving lads by whom he was surrounded, and how important then to each of them would be the power of taking his place quickly in a station—already, perhaps, in the social occupation of a Corps or two of red-coated military-men—in which he would have but a fortnight or so to spend ; otherwise, the long-looked-for recreative race-week, or cricket week, with its dances and theatricals, might well prove no time of rejoicing, but a time of mortification rather, and send the holiday-maker back to the *mofussil* with the sad consciousness of failure. He showed the students considerable hospitality, therefore, and took pains to have them introduced to the gentry of the country-side, sure that the companionship of English ladies involved in tennis-parties, picnics, and dances is an important item in the education of the complete Englishman. This, indeed, most Coopers Hill men would get at home ; some, however, were less fortunately placed, and for all of them was it good.

In this work, Sir Alex, like Sir George Chesney, was fortunate in finding his ablest and most sympathetic helper in his home. Lady Taylor's delight in the *joie de vivre* of young people was the measure of her sympathy when things went ill with them. Sorrow, sickness, and death find their way everywhere. It was those on whom shadows fell who knew the comfort of her ready helpfulness, and the passion of pity with which she accompanied them along

darkening ways. Nor did her tenderness go unrecognised or unrewarded.

Such was the attitude of Sir Alex and Lady Taylor towards the students. What was the students' attitude towards them?

It is admirably suggested in a letter written in after years by Mr Mackenzie. "Sir George Chesney," he writes, "was succeeded by Sir Alex Taylor in the Presidency of Coopers Hill. There was a very great contrast between the two men, the former initiated, the latter consolidated. Both were immensely distinguished, and in a sort of way we were aware of this and of the honour which they reflected on us. But youths are interested chiefly in what affects themselves. It meant but little to us that Sir Alex had been one of the principal actors in the siege of Delhi, and that his adventures and experiences would have made a book. We knew that all this was very fine, but we took things at first hand, and the important thing to us was how he affected us as President. . . . Such is the egotism of youth. Not that we could have got much information from him had we tried. There never was a man more reluctant to talk of himself; and it was only from chance words uttered in unguarded moments that one could guess that he had ever seen war, or wounds, or death; and even then he sketched his own share in the experiences alluded to in a jocular fashion.

It is quite impossible to separate Sir Alex from Lady Taylor. Any picture of the one evokes an image of the other. They were kindness itself to the students; and, among the rest, I was privileged to see something of their family life. They were both absolutely unaffected and unofficial; and we accepted their kindness and hospitality in happy ignorance that it was uncommon in its essence. Looking back, one can see how very uncommon it was. It ought to have been extremely heavy work to entertain us raw youths, and

would have been so to most people in similar positions ; but they never showed a sign of it, and I doubt if they felt it ; the result, this, of the overflowing kindness of their hearts, which were large enough, and loving enough, to include the dull, the awkward, and the uncouth ; perhaps, even to prefer them. Of Lady Taylor, we always said that her eyes shone when she heard that any one of us was ill, because she could then go and look after him.

Looking back to those happy days, and trying to formulate my impressions, there rises before me the picture of a man with a keen, eager face, a delightful smile, and shrewd but very kind eyes. He seemed always cheerful and happy, and had an infectious low laugh. I remember looking at him, and thinking of him with all a young man's hero-worship, because Sir Richard Temple—whom I had met somewhere—had told me that he was 'as brave as a Paladin.' But, strangely enough, I see now that there was a distinct element of protectiveness in my feeling towards him, instinctive, no doubt, the outcome of an unconscious perception of the guilelessness and simplicity of his nature. A more simple-hearted man never lived. He seemed unable to imagine a deliberate deception, or a sordid or even mixed motive. This, of course, was speedily apparent to such shrewd observers as youths, and it put us on our honour. There was never any attempt to deceive him or to palter with the truth. Beside our knowledge that he would believe us, there was, I expect, a consciousness that in the greatness and charity of his heart he would forgive and allow for a confessed fault, even if it had to be punished. . . . He was an intensely religious man, and made religion the standard of his life."

Youth is more than shrewdly observant—as Mr Mackenzie describes it—it has an almost uncanny perception of the realities of personality, deeply hidden under

appearances though they be, and it is characteristic of its clairvoyance that a student to whom Sir Alex was known only as "the President," or the "Duke," and who was in complete ignorance of his Chief's history, was nevertheless so acutely aware of something in the virile and autocratic man before him which was sensitive and might need protection, as to be driven to dwell on it thirty years later, when he was endeavouring to formulate his recollections. This—of which Mr Mackenzie was instinctively aware—was what made Sir Alex Taylor helpless in the face of the one personal injustice of any moment which ever fell to his lot.

Of his private life throughout these long years at Coopers Hill, there is little to be said. He gathered his children about him, keeping his two girls at his side and their mother's, for a time at least, while his two boys went backwards and forwards to Sandhurst, until the sad day dawned on which they too—taking the way of the sons of Anglo-Indians—embarked for the East; the eldest, Alex, having joined the "Queen's," then stationed in India, while the youngest, Neville, to whom horses were a delight, entered the XIVth Bengal Lancers—"Murray's Jat Horse"—a regiment raised in the far-away days by a dear friend, "Jock" Murray.

As at Chatham, so at Coopers Hill, sailing and boat-building were his chief amusements. He designed a river sailing-boat, the *Lily*, of which he was extremely vain, which carried a centre-board and a quite inordinate spread of white canvas. He sailed it himself with the help of his own boys at first, and then with that of recruits from the College, and won a considerable number of racing cups. It was a charming sight to watch the boat cutting rapid zigzags across and across the long blue reach at Anchorwyke, heeling over until its white wings almost lay upon the river-water,

while its steersman sat at its stern, his face grave and tense, his whole being as solemnly concentrated on the job-in-hand as if it were the pivot of the movement of nations.

Sometimes when he "ran the thing too fine" and the unexpected occurred—which will happen occasionally—the water would rush into the heeling boat, the mast and white sails would become slowly vertical, and with a gurgling sound the vessel would go to the bottom of the Thames, to be raised, with great labour and much danger to the fragile craft, some few days subsequently. An incident this which became more frequent as Sir Alex grew older, and one which he took much to heart, for it reflected on his professional judgment, his intention having been to run close to the wind, but not to sink his boat. Neither was it to Lady Taylor's liking. It is not pleasant to see a husband who is nearing the completion of his three-score years and ten and is troubled with rheumatic gout, sitting unperturbed in a sinking boat, or swimming for dear life in ice-cold water. It was this spark of danger, however, which made sailing on the Thames possible to an old man who in his day had swum the Indus at Attock, and had tumbled down the torrential Punch in a coracle.

Their President's sporting sailing endeared him to the Coopers Hill men; though it has been said by one behind the scenes "that students sometimes turned his enthusiasm for boating to their own advantage—maliciously introducing the subject of sailing when sent to 'the Duke's' study for a 'carpeting,' in the hope that by propounding some new 'gym' they might escape the full penalty of their misdeeds." Indeed, Sir Alex's vitality and boyish spirits, which were maintained until the end of his Presidency, were amazing, especially when taken in connection with the strain and hardship of the greater part of his life in India. "When he was not far short of seventy years

of age he was seen to climb up to a third-floor window of what was known as the 'new block' at Coopers Hill, with the object of personally determining whether it were possible to obtain ingress to the College by a route other than that of the Porter's Lodge"—this is a note by a sympathetic observer.

A man of this type, so simple, so virile, and so generous, could not fail to win the hearts of the young men whom he had taken under his wing, and to attune their lives to the better things.

Time passed, bringing honours which had their roots in distant days. Time passed: old friends—returning to England like homing birds—gathered about him, giving substance to memories which lay behind the green peace of Surrey like martial music and the tramp of armed men heard from a still backwater.

In 1889 he was created a Knight of the Grand Cross of the Bath, and had the privilege of investment by the Queen's own hands. Lady Taylor and her daughters were frequently associated with him in the honour of invitations to parties at Windsor Castle, at which her Majesty addressed herself to him with her habitual graciousness, and at which he was given more than one opportunity of conversing with the Duke of Connaught, of whose military ability he formed a distinguished estimate.

In 1881, he was asked by his late Chief, Lord Napier, then Constable of the Tower, to stand as godfather to his youngest son, Albert Edward Alexander, in which position he had the honour of association with two august sponsors—King Edward VII. and Queen Alexandra, then Prince and Princess of Wales.

Nine years later (1890) it was his sad privilege to serve as one of the pall-bearers at the funeral in St Paul's of the

same great and dear Chief; he and his companions in this last service having been selected by Lord Napier himself out of the number of the men who had been associated with him in both public service and private friendship. Seldom has a public funeral enshrined a heavier heart of personal sorrow; for Robert Napier was a man who commanded, not admiration and reverence only, but love; so human was he, so able and so helpful, so disinterested and so chivalrous; the Bayard of his Corps—*sans peur et sans reproche*.

Hardly two weeks previously Lord Napier and he, walking together, had accompanied the body of their dear comrade and friend, Sir Henry Yule,¹ to its last resting-place. Soldier, statesman, scholar, cosmopolitan, and man of letters, Sir Henry was distinguished among his peers by personal charm, born, not only of a stately presence and great intellectual gifts—though these were his—but of the generous joy with which he greeted *quality* in whatsoever phase of life it revealed itself to him. Remarkable also was his power of appreciating the really significant and valuable in the literary records of the adventurous traveller both of to-day and of mediæval times, a power which made him a great geographer of bygone days and of countries he had never seen. It is with absolute propriety that his biographer, General Robert Maclagan, R.E., applies to him an appreciation dedicated by Bernier to a fellow-geographer whom he called :—"cet illustre curieux qui nous donne tous les jours plus de découvertes, sans sortir de son cabinet, que nous n'en avons appris de ceux qui ont fait le tour du monde." It was to these endowments, both aspects of one gift—sympathy—that the translator

¹ Colonel Sir Henry Yule, K.C.S.I., C.B., LL.D., R.E., sometime President of the Geographical Society and Member of the Council of the Secretary of State for India.

and editor of Marco Polo's travels owed both his position in the world of savants, and the phalanx of distinguished personal friends who looked for him in every capital of Europe.

Remarkable also was Sir Henry's literary equipment. How sensitive was his appreciation of the value of words, and how scholarly his manner of handling them is evident in the noble and pathetic lines penned on his death-bed in acknowledgment of his election as Corresponding Member of the Académie des Inscriptions et Belles Lettres, a much-appreciated honour announced to the dying man by telegram, for his French Colleagues' Latin sensibility made them eager that this ray of light should reach their friend before the mists of death swept between him and them for ever. "Reddo gratias, illustrissimi domini," he wrote; "ob honores tanto nimios quanto immeritos. Mihi robora deficiunt, vita collabitur, accipiatis voluntatem pro facto. Cum corde pleno et gratissimo, moriturus, vos, illustrissimi domini, saluto."

In the spring of 1895 Sir Alex was shocked by the sudden and most unexpected death, through heart failure, of his younger comrade and predecessor in the Presidency of Coopers Hill, Sir George Chesney, who had left the Service three years previously, and was then representing Oxford in the House of Commons. He had just returned from a fatiguing *tournee* among his constituents, during which he had addressed several large meetings, when the cold hand of Death touched his shoulder, and the able and valiant worker—from whose parliamentary-career results of the first importance were expected—was gone. After he had left Coopers Hill and had held office for six years as Secretary to the Government of India in the Military Department, he was placed at the head of that Department, Lord Roberts then being Commander-in-Chief in India.

The collaboration of those two brilliant intelligences resulted in an epoch-making phase of the military administration of India—the Native States and Chiefs were united in a scheme of Imperial defence, and their soldiery moulded into the magnificent Corps they now form; the equipment, organisation, etc., of the Army was worked up into a previously unheard-of state of efficiency; and Indian defences, together with co-ordinate railway communication along important strategical lines, were completed. On leaving India, Sir George had determined to make the knowledge he had garnered from so wide a field effective in England, and with this end in view he secured his Seat in the House and inaugurated a campaign for the purpose of expediting certain reforms in the methods of the English War Office by a series of articles in the *Nineteenth Century*. Golden results were anticipated from his tenacity and ability. Suddenly, however, the realisation of these patriotic schemes was vetoed by Death. He was buried near his mother in the graveyard of the parish church of the district in which Coopers Hill stands. His tombstone was the last tribute paid by many friends to a great and brilliant organiser, a loyal Chief, a valued President, a charming writer, and a delightful companion.

And thus, old friend after old friend slipped away.

Time passed, and Sir Alex came at last to feel that the long afternoon of his life was passing into evening, and that night and rest were not far distant.

In 1896, he relinquished the Presidency of the College. In the parting words addressed to the Coopers Hill men on his last Speech Day—Lord George Hamilton then being Secretary of State for India—he dwelt on the ideal which he had successfully striven to make that of all the men who passed through his hands. After alluding to certain warm

appreciations of the character and loyalty of Coopers Hill men communicated to him by members of his own Corps in India, he drew the attention of those present to the fact that the quality especially underlined in these commendations was "the honourable devotion of our men to their duty, even under circumstances calculated to damp and depress. Here we have *grit*," he said, "the quality that goes to make a service distinguished. This personal quality is beyond the reach of lectures, laboratories and examinations, but not beyond the reach of *esprit de corps*, . . . an animating spirit able to develop and strengthen the latent qualities of men." "I desire strongly," he added, "to have it fostered at Coopers Hill in every possible way."

He then told them that in reading Younghusband's *The Heart of a Continent*, he had come on a passage in which the author attributes the predominance of Europeans over Asiatics, not to superior intelligence, but to greater toughness of character and to the practice of an instinctive altruism which has its roots in the principles underlying Christianity. "Europeans," writes Captain Younghusband, "are anything but perfect in the practice of these principles, but when we hear of a wounded British officer dismounting from his pony, and insisting upon his wounded comrade mounting in his stead and riding back in safety while he walked, though the enemy were firing from all sides, then we know that such principles are sometimes applied ; and it is because they are more frequently and thoroughly applied by the Christian than by the non-Christian races, that the former have been able to establish their superiority." "At this stage of my reading," said Sir Alex, "I looked to the note at the bottom of the page . . . and saw with a glow of pride that the wounded British officer who acted so nobly was Lieutenant Fowler, a Coopers Hill man, who had been given a com-

mission in the Royal Engineers direct from Coopers Hill on the completion of his course. When I say 'splendidly done, Fowler,' I am sure that not only every Coopers Hill man, but every Englishman, is heartily with me. And what is it we so thoroughly admire? Is it not that, Fowler's early Christian training having shown him his duty, he had grit enough not to be deterred from doing it by any consideration of personal safety?"

And once again, in his last "last words" he summarises his ideal: "The great incentive will always remain the same—your sense of duty and honour, and your loyalty to your Government."

On bidding him farewell the members of his Staff presented him with a volume containing water-colour sketches of the College and its neighbourhood, prefaced by a beautifully-illuminated dedication, in which, after alluding with gratitude to a "life assiduously devoted to the welfare of the College," its writers add: "Those to whom the welfare of an Institution so closely connected with India are dear cannot refrain from expressing thankfulness to Sir Alex Taylor on wider grounds than these: for the pages of English history remind them that, but for the heroic and devoted services of Englishmen in India nearly forty years ago, there might be no Indian interests for them to cherish; and that prominent in this record stands the name of Sir Alex Taylor."

"When he left," wrote one of the Staff, "we felt that we had lost, not a President only, but a companion and a friend." "His was a great and inspiring influence for good, the memory of which must always abide with those who knew him," wrote one of the young men whom he had trained.

And thus, serenely, the sun set on Alex Taylor's working day.

CHAPTER XXV

LAST DAYS

ON leaving Coopers Hill in 1896 Sir Alex and Lady Taylor travelled on the Continent for upwards of a year, pending the completion of a house which they were building on Englefield Green. It stood close to the home of their youngest daughter, Mildred—whose husband, a Fellow of Coopers Hill, was then on the College Staff¹—not far from the College itself, in which the ex-President's interest had become grandfatherly, and within reach of the river, on which he still hoped to sail his *Lily*.

Sir Alex's successor was a brother-officer of distinction, Colonel Pennycuick²—the hero of one of the most impressive engineering feats of this or any other age—who had forced a mighty river of Southern India to change its course, and, instead of flowing Westward into the Arabian Sea, to run Eastward into the Bay of Bengal, from which it was separated by the mountain-backbone of the Southern peninsula.

The following briefly are the main lines of an undertaking the varying fortunes of which Sir Alex had followed for years, both on account of its professional interest and because the members of Colonel Pennycuick's Staff were

¹ Richard John Woods, F.C.H.

² President of Coopers Hill, 1896-1899. Son of Brigadier-General Pennycuick, who was killed at the battle of Chillianwala.

and so loved to be loved—was aware of it. His funeral is said to have been inexpressibly touching. The band of the 60th Rifles filled the air with the alternating sorrow and heavenly gladness of Chopin's Funeral March as his coffin—covered by the Union Jack, surrounded by his brother-officers, and followed by the native officers of his Corps and by all the officers in the station—was drawn on a gun-carriage to the cemetery along a road lined on both sides by the men of his regiment, his own squadron being stationed close to his last resting-place. The service followed; the volleys; the hymn-tune—"When our heads are bowed with woe"—played by the band alone, for none could join; and then the "Last Post" was sounded. All was over.

And thus honoured and loved, "one of the straightest men and truest gentlemen"—as more than one of his friends called him in their home-letters—ran his course, and was laid in a grave above which some of his brother-officers had begged should be written, "Blessed are the pure in heart."

During the previous year Sir Alex had the pain of seeing Coopers Hill College dissolved, and a limit placed on the existence of the great civil counterpart of his own Corps, in the interests of which he had laboured so hopefully and with his eye on such long perspectives. His regret was deep. His pride in the work accomplished was great, however—work rounded by this arbitrary dissolution into a compact and intelligible whole. He was satisfied with his men; they had acquitted themselves manfully, their professional reputation stood high, and their personal honour and disinterested service had created a tradition to which their successors will assuredly conform.

"Coopers Hill has not vanished," said Dr Unwin

at a public dinner some years later. "It remains in the fraternity of those educated there; its monuments are the great Public Works carried out by Coopers Hill men in India and other countries. The service it has done to the nation is very great, and the results of its work, such as will long endure"—words to which Sir Alex would have given his hearty assent.

Its suppression was preluded and followed by an outburst of indignant protest. Lord Curzon, writing from Simla, towards the end of 1903, informed Mr Brodrick—afterwards Lord Midleton—that the members of the Government of India desired to record their unanimous protest against the closing of the College, and stated that the heads of the various Governmental Departments were strongly in favour of its continuance. But the enemies of whom Mr Gladstone had spoken some thirty-five years previously—the Civil Engineers, the Schools, and the Colleges—had gathered strength since then; they carried the day.

"And thus," writes the *Times*, "passed away an Institution which had made history, and which had gained prestige for British Engineers through the world. Its subversion has never been explained, and has never been justified. All that can be said is that it was this country and not India that overthrew it, and that it has established honourable records wherever British Engineers have carried out great works."

The irreparable loss of the son whom he had loved to picture among familiar scenes, and the destruction of a Corps to which he had looked for splendid Indian public service through future ages, severed Sir Alex's connection with the country in which he had spent the better part of his life, but from which all his friends—all his younger contemporaries, even—had already withdrawn: a country which had grown to be a land of ghosts and memories.

Thus—confident in the power of One whose strength is made perfect in weakness—Alex Taylor's life drew to its close. After having dared death in many forms, he passed quietly away—with those who were nearest and dearest to him at his side—at midnight on 10th February 1912, aged 86.

"Sleep after toil, port after stormy seas,
Ease after war, death after life, doth greatly please."

"It was not what he did, though that was splendid, which made us prize him so," said one of his comrades, "but what he was."

The War Office proposed that Sir Alex should be buried with military honours, but his family felt that he would have wished his funeral to be as unostentatious as his life had been. He was laid to rest, therefore, in the precincts of the village church—not far from the grave of his predecessor at Coopers Hill and companion at Delhi, Sir George Chesney—in the presence of a number of neighbours, many of his College Staff, and a few of his old comrades at arms—Sir Frederick Maunsell, Sir John Watson, General Pemberton, and others—a small party of octogenarians. General Sir John Ewart, Aide-de-Camp General in Waiting to the King and Adjutant-General of the Forces, was present as representative of the King, having been graciously sent by his Majesty to express his high sense of the services rendered by his loyal servant.

The members of his Corps have placed his portrait—painted for them by Edmund Brock—in the Engineer Mess at Chatham, where it now hangs in the company of old friends—Lord Napier of Magdala and Sir Henry Yule—and of such distinguished brother-officers as the great General Gordon and Lord Kitchener.