

## PRESIDENTIAL ADDRESS.

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*(Read before the Sydney University Engineering Society  
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BY, J. W. ROBERTS, B.E.

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GENTLEMEN,—The Society's year having once more come full circle, and the customary election of officers for the ensuing session having been duly carried out, there remains only the duty and privilege of addressing you from the chair on some matters of common interest. Out of the fullness of their wisdom the founders of our Society decreed that this task should be allotted to the retiring rather than to the incoming President, imbued, no doubt, with the notion, that after twelve months experience of the responsible handling of the Society's affairs, one would or, at least, should acquire an intimacy with its difficulties and its aspirations, or, in a word, with its inner spirit, which should prove of service in the preparation of an address of this character. I merely mention this in passing because it marks a point of difference between this and many other Societies. I would like to quote just here, as not unseasonable matter, the somewhat caustic remark of a famous English engineer, on an occasion such as this, in which he characterised Presidential Addresses generally, as out-of-date productions which no one reads though many are still written; and thereupon, paradoxically, proceeded to give a most brilliant discourse, which still repays perusal. You will understand, of course, that while to some extent endorsing this point of view, I cannot hold out any hopes of so gratifying an anti-climax.

In the Annual Report of the Council, which was read to you to-night, the various matters of interest and importance that arose and were dealt with during the year have been fully set out. Inasmuch, however, as the printing of this document has not been a custom with us, except in the form of a brief abstract, and as there are in it certain actions of which there should be some record, and which call for further comment, you will pardon me for again referring to them.

At the outset, the Council, with which I had the honour to be associated, was confronted with a difficulty, not altogether a new one, for previous Councils had been in some respects similarly situated, but certainly a grave one. Expressed briefly it was this:—There was a great deal to do, and there was little or nothing to do it with. The Council, in fact, found themselves as it were in

a boat without oars, and there was no other boat handy from which oars, to use a popular term, might have been 'commandeered.' Well, the end was simply this, that we had to go, cap in hand, to the general stores, and ask for a pair; and I hope, gentlemen, that the necessity won't arise again, at least, not in that way; it is much better to receive, even unexpectedly, than to go asking. Neither, as a matter of fact, would be necessary if a wider feeling of loyal interest in the welfare of the Society predominated amongst the members, and if it was not left to the enthusiastic few to bear the brunt of the solid, hard work that must precede success. When I consider all the forces that are, or should be, at the back of this young institution, I realise profoundly the great destiny that lies before it, if those forces are directed by sincerity of purpose and by that divine gift to youth, enthusiasm. As we admittedly suffer somewhat from the faults and disabilities of youth, let us not be found wanting at least in its great cardinal virtue.

To return now to concrete matters.—The publication of that bulky and expensive but withal excellent volume, the 1903 Journal, made a severe strain on our finances, and delayed, to a regretful extent, the appearance of its successor, which in fact had not been printed when the new Council took office last year. There was, however, only a credit balance of £15 5s 1d with which to start operations, though the arrears of subscriptions amounted to no less than £70 odd. Had a reasonable proportion of those arrears been paid in at an early date, the 1904 Journal would have appeared very much sooner. However, with a great deal of coaxing, we did succeed finally in getting some portion of them in. Meanwhile something drastic had to be done, as it would simply have meant postponing the difficulty to have relied on the current year's subscriptions, and delayed the next Journal. To ensure finality, therefore, the Council resolved, though with considerable reluctance, to approach the Senate on the matter of financial assistance, putting forward the plea that the Society was doing useful educational work which depended to a large extent on the regular publication of the annual volume of proceedings. The Senate were prompt in recognising the justice of this plea, and made a liberal donation. A considerable amount of the financial lee-way was made up during the year, partly owing to the energetic action of the Secretaries in rounding up recalcitrant members and partly to the issue of the 1904 Journal, which, I think you will agree with me, forms a worthy addition to its predecessors, and which contains some stimulating remarks by Mr. Strickland in his Presidential address, in reference to the apparently decaying esprit-de-corps of the Engineering School. I say "apparently" because I am convinced that the apathy displayed is not due to incipient "dry rot" but rather to the lack of proper "seasoning." Our material is so far just a little green, but there is no doubt about its soundness, witness in proof the prominent part taken by the Engineering School generally, and undergraduates thereof in particular, in all the various centres of activity that encompass the University.

Our total roll now includes 186 ordinary and 9 honorary members, representing an additional membership for the year of 37 and a loss through death and cancellation of 16 members. The financial members number 107, and the total amount of arrears owing to the Society is £64 ls. It is anticipated, however, that the issue of the 1905 Journal now in the press, will considerably reduce this latter figure. A new departure is proposed in this volume, namely, the publication of the annual balance-sheets for the years 1903, 1904, and 1905, and in all future Journals the regular insertion of the current balance-sheet. I trust this somewhat long digression on financial matters will be excused by members, on the ground of the vital importance of the subject and the advantage of a liberal shedding of light on all its phases.

With regard to the papers contributed to the Society last year, of which the list has already been presented to you, it may be said generally that they are not lacking in either variety or interest. One notes with pleasure the large proportion written by undergraduate members, dealing chiefly with mining subjects. The Prize Fund, which is maintained by successive Presidential contributions, after a long period of integrity, is at length to be disturbed for the purpose for which it was originally inaugurated. The Council, on the recommendation of its sub-committee, awarded the prize to Mr. J. M. Bridge for his paper on "The Treatment of Slimes at Mount Boppy," at the same time placing on record their very high opinion of the paper by Mr. H. J. Swain on the "Design of a Three-ton Winch." I congratulate these students on their very excellent papers and trust, now that such a good start has been made, that the award of the prize will be an annual feature. In accordance with its custom of occasionally inviting engineers outside the Society's membership to contribute papers, the Council made arrangements to that effect with Mr. W. F. Burrow, A.M.I.C.E., of the Public Works Department, who gave an interesting exposition on the "Accurate Setting-out of Bridge Piers," for which the Society is much indebted. Among the ranks of new members must be mentioned the name of Mr. E. Kilburn Scott, lecturer in electrical engineering, whose paper on "A proposed Power House for the University" aroused a considerable amount of animated and interesting discussion, the essential portion of which, it is hoped, will be published in the Journal.

It is with regret that I have to refer to the death of two of our prominent members, Sir Peter Nicol Russel, and Mr. J. F. Morris, B.E., F.G.S., the one respectively at the close, the other at the beginning of his career. The former was one of the original pioneer engineers of this State, and one of the most noteworthy. When, as a mark of sympathy with State engineering interests and education, in 1896, he donated £50,000 to the University for the encouragement of civil and mechanical engineering, stipulating that in future the school should be known as the Peter Nicol Russel School of Engineering, he established for himself a monument more enduring than marble. In 1904 he sent a further contribution of

£50,000 to encourage electrical engineering, with the proviso that the State Government should erect buildings and instal machinery to the extent of £25,000, which was agreed to. Without these munificent bequests the Engineering School could not, in so brief a time, have possibly become the well-equipped educational establishment that it is to day, and the progress of this Society would have been similarly retarded. Our late benefactor was made an Honorary Member in 1896, and received his Knighthood in 1903. Mr. J. F. Morris, B.E., graduated in 1899 in mining, his scholastic career being marked by many successes. After some considerable travel and experience in various parts of the world, he ventured into the fatal precincts of the Malay Peninsula, where his promising career came to an untimely close on the 23rd December last.

Mention was made in the report of the appointment of delegates to represent the Society at special conferences. One of these was in connection with the Union Building Fund, a movement, I think, that is sure of the hearty sympathy of our members, seeing that its ultimate objects are very much in line with those which form the foundation of this Society. The other conference consisted of representatives appointed by various engineering and allied societies to consider the question of qualification for shire engineers in connection with the Local Government Bill then being debated in Parliament. A list of resolutions was adopted, which practically set out that a shire-engineer should be either an Associate Member of the Institution of Civil Engineers, a graduate of the University of two years standing, or a licensed surveyor of three years standing. Though not embodied in the bill, which has since become law, these resolutions have, I understand, been incorporated in the regulations dealing with appointments under the Act. A fresh field has thus been, to some extent, opened up for the civil engineer in which to gain experience, though for various reasons the position of shire-engineer elsewhere has not been considered in the past an attractive one. It is to be hoped that such will not be the case in connection with our own proposed experiment in Local Government.

There is just one other matter connected with the year's business which calls for some comment. The necessary additional clauses to the Constitution, to enable the formation of Branch Societies to be duly carried out at important centres, where a sufficient number of graduate members had come together, were discussed at some length and finally approved at a general meeting towards the end of the year. It is hoped, and reasonably so, that these branches, as they are formed, will prove a source of strength to the parent institution, and that a much more liberal flow both of papers and of subscriptions will thereby be encouraged. A branch had been previously formed at Kalgoorlie, W.A., in anticipation of this step and in due course will no doubt be properly incorporated under the special clauses.

Last year the Engineering School attained its majority, and the Society completed a decade of its existence. The concurrence of

these two interesting events suggested, as an appropriate theme for part, at least, of this address, a brief retrospect of the early days of the School, and of the main events leading to the inception of the Society, together with some record of its progress up to the present time. The old Greek philosophical axiom:—Know thyself—should apply to groups as to individuals. If, through such a review, additional interest in the welfare of this Society should be stimulated, then a good purpose will have been served; in any case some information, at present somewhat scattered, will have been collated and placed on record. I am well aware that there is a proposal in the air to have a history compiled dealing with this question, and covering the whole field in a more or less exhaustive manner, including among other items a complete index of all papers contributed to the Society to date. What I propose to present to you to-night is something much less elaborate and more in the nature of an abstract of such a possible history, which, it is to be hoped, will make an appearance at an early date.

The first engineering classes at this University were formed in 1884, and held originally in the main building, but afterwards in a small portion of the present edifice, under the lectureship of Mr. W. H. Warren, Whitworth Scholar, Assoc. M. Inst. C.E., at which the regular students numbered three, viz.: Messrs. Rygate, Merewether, and Wood, all of whom graduated but only one of whom, Mr. Rygate, continued in the profession, subsequently taking a large share in the formation of this Society. The course covered two years, all students being required to previously pass the first year in Arts, and practically Civil Engineering was the only branch dealt with. The total laboratory equipment consisted, I understand, of a wood-turning lathe. In addition to the regular class, a number of outside students in professional employment were invited to attend some special lectures on bridge design. The growth of the school was somewhat slow in those early days, the small number of students taking up the course not justifying any great expenditure in workshop equipment. In 1889 there were eleven graduates and six undergraduates, while the laboratory contained the smaller of the two testing machines, with a small boiler and steam engine driving three or four machines. In 1891 the building was extended to its present dimensions, a cement testing machine, designed by Prof. Warren, a gas-engine, and several metal working machines added to the equipment and the experimental engine installed. Even in those days, diminutive as the numbers were, the possibility of a Society was mooted, and its aims and ideals discussed around the luncheon board. In 1892 Mr. E. F. Pitmann was appointed lecturer in mining, and the first degrees in mining and metallurgy were obtained by Messrs. Nardin and Weigall in 1894. The bequest of Sir Peter Nicol Russel in 1896 enabled a proper course of electrical and mechanical engineering to be established, the first graduate being Mr. H. W. Myers in 1903. Since then, the scope of the school having been so extensively enlarged, the laboratory equipment has been continually

extended and improved, finally reaching the stage with which you are familiar at the present time. The erection of new buildings by the Government, which will be extensively equipped under the second P.N.R. bequest, marks the final stage in the progress of the School, and forms a fitting climax to its career for the present.

The first practical movement towards the formation of a deliberative Society took place in 1895, the question, before that, not having got beyond the stage of post-prandial discussion, of which there had been ample. The undergraduates took the matter up very seriously, and organised all the preliminary meetings which culminated in the formation of a provisional committee, who made arrangements for the inauguration of the Society at a general Meeting, held on October 9th. From the minutes of proceedings of that date, which form the Society's earliest record, I cull the following items of interest:—Mr. T. P. Strickland, then an undergraduate, took the chair, and Mr. Rygate moved the first proposal in terms which are practically identical with those used in the first clauses of our present Constitution. This being carried without dissent the election of officers took place and resulted as follows:—President, Professor Warren, M. Inst. C.E.; Vice-presidents, Messrs. G. H. Knibbs, J. Sulman, F.R.I.B.A., E. F. Pitmann, A.R.S.M.; lecturers insurveying, architecture and mining respectively, and W. M. Thompson, M.A., B.E., graduate; Members of Council, Messrs. H. H. Dare, M.E., and N.F. White, B.E., representing the graduates; and Messrs. Strickland, Shortland and Reid, the undergraduates; while Mr. H. J. Deane took up the important position of Honorary Secretary and Treasurer. In the absence of Professor Warren, then in England, Mr. Knibbs read an inaugural address, and a general discussion ensued on the practical scope and working of the new organisation. Subsequent Council Meetings were held, at which the original Constitution was drawn up and submitted to a General Meeting on the 13th November, and with few exceptions adopted. At this meeting the first paper contributed to the Society was read by Mr. S. H. Barraclough, B.E., on "The Present State of Our Knowledge of the Steam Engine."

The number of graduates on the School roll at this time was 33, and of undergraduates 30, while members of the Society numbered 43, representing 66 per cent. of the total roll call, including the teaching staff. At the end of 1900, five years later, we find on the School roll 65 graduates, 90 undergraduates, 4 members of the teaching staff other than graduates, and 148 members of the Society, or 93 per cent. of the available total. This was our record year, though it may be open to considerable doubt whether the whole of the members were at the time financial, or even subsequently became so. At the end of last year, representing another skip of five years, the numbers ran:—79 undergraduates, 150 graduates, and 7 members of the teaching staff, in conjunction with 186 ordinary members of the Society, equivalent to 79 per cent. of the available total, a not unsatisfactory position considering the large number of members that have been struck off the roll during the last two years.

The question of preserving some record of the papers contributed was an early difficulty. At one time it was proposed to print them as a supplement to *Hermes*, but this was never actually carried out. Up to the end of 1896 the papers were, with one exception, typed, and a bound copy of all these early papers is in the University and Free Public Libraries. The exception referred to was the paper by Mr. H. H. Dare, M.E., on "The Opening Bridges of N.S.W.," which was the first printed publication of the Society. Subsequent papers were printed where approved by Council, but individual members were left to do their own binding if they so desired. The first bound volume to be presented to members, actually the fifth volume of Proceedings of the Society, was for the 1900 session, and was printed by Mr. F. Clark, who has acted from that time up to the present as the Society's printer and publisher.

In all, seventy-three papers have been contributed to the Society, of which sixty-one have been printed and seven typed, the balance not being preserved in any permanent way. Thirty-six of the papers are by graduates, fifteen by students, ten by members of the teaching staff, and six each by honorary members and visitors. Forty-three of the papers may be classed as referring to civil engineering, seventeen to mining and metallurgy, seven to mechanical engineering, and six to electrical engineering. Of the forty-three papers in the first list, twelve deal with materials and structures, ten with general progress and education, eight with roads and railways, seven with sewerage, five with rivers and water supply, and one with a purely scientific subject. It will be seen from this analysis that the field covered has been a wide one, and deals with all phases of engineering. While on the subject of papers I should like to draw the attention of members to the difficulty the Council have each year in maintaining a supply of contributed matter for the current meetings. With our present large roll of members there may be some difficulty in understanding this, but an analysis of the papers already contributed affords matter for comment on this point. The thirty-six papers already forwarded by graduates represent only twenty-six contributors out of the hundred odd graduate members of the Society. It is reasonable to expect that some, at least, of the balance have been working under conditions which should yield good copy for the Journal. The preparation of a paper certainly involves a very considerable expenditure of time and energy, entailing much personal sacrifice, but surely the Society, if worth joining at all, is worth this kind of sacrifice, and there is a compensating gain. It must be remembered that these technical contributions are the fuel from which the Society draws its energy, without which it must rapidly slacken its pace, degenerating finally into a mere vessel, full of dead ashes, destined to be flung by its more virile competitors on to the scrap heap of time.

Getting away, now, from ourselves, and glancing broadly at the engineering activity, so variously manifested in the four

quarters of the globe, we gain an impression of ceaseless irresistible organised human energy attacking nature in a thousand different ways, but always for one purpose, the augmenting of man's material comfort and convenience. Thus we are for ever wresting from her, despite her reluctance, coveted things from her inexhaustible stores; chaining down and harnessing her mighty forces to serve our personal ends; or cutting and moulding her native ruggedness into some semblance of tame uniformity which will not obstruct us when we have a mind to speed defiantly over the long blue distances that once had power to chill. No triumph, however complete and splendid, can long satisfy us; a moment's pause and then the insatiable craving for still further achievements must have its way.

Time was when the engineer, resting a while from his labours, might calmly scan the fields, wherein the brothers of his profession were engaged, might even turn an idle eye to view the exploits of the physician, chemist, or biologist, feeling the glamour which Science sheds upon all her manifold byways. But the leisure days seem over, the sphere of his activity has enlarged in such measure that it begins to overlap the special domain of all these other investigators, and has itself ramified into so many branches, of such complexity and range, as to require each a library unto itself for its due and adequate expression. The times being thus so strenuous, the engineer of ordinary mental equipment must choose between covering the whole field of insistent progress in a more or less superficial manner or devoting his energies to one particular corner of the field and exploiting it as thoroughly as he may. Even within these limitations he will find the rate of acceleration of human activity quite as rapid as he can comfortably keep up with. Yet if he has the philosophic spirit he will still feel the impulse, as of yore, to step over the borders, to broaden his outlook so as to include all lines of thought, all paths of progress, thus coming in contact with a larger number of his fellows and sharing with them a common interest, which is one link, at least, in the chain of professional comradeship.

When one contemplates such gigantic undertakings as a Nile barrage, a Manchester or Panama ship canal, an American, African, or Canadian transcontinental railway, a White Star or Cunard liner, a Forth or Manhattan bridge, one's admiration for man's intelligence and skill is profoundly stirred and the old question will materialise,—if one can do *these things now* what will be done *hereafter*? There were giants in those days, we are told, by the man who looks ever reverently to the past, but the race is still alive and energetically doing its work, only we are too close to it and to the doers of it to realise thoroughly the greatness that is stamped indelibly upon it; the truer perspective will only come with time.

In Australia we must be content for a while to present a more modest exhibit. Yet, here, too, we have our show pieces whereat, with chin uplifted and thumb in brace, we are apt to