

11th OCTOBER, 1917.

PRESIDENTIAL ADDRESS.

Delivered by Mr. D. F. J. HARRICKS.

A year ago I assumed office as President of the Association with a very deep sense of indebtedness for the honour conferred upon me, and I am still more deeply grateful for the compliment you have paid me in electing that I should continue in the office for a further session. I take this opportunity to thank both officers and members for all the kindness, friendliness and co-operation manifested to me during the past year. I have always felt that it meant something to belong to the Association, and have endeavoured to remember my obligation to work for its welfare; but, when honoured with the highest office in the gift of the organisation, I realised that it was placing a trust and a confidence which could only be repaid by the utmost loyalty and devotion to its interests. I can safely promise to answer these calls. The post is no sinecure, and makes demands upon one's time and judgment. Happily, however, the long experience of the Association has established many precedents that very considerably ease the difficulties to be met. Generally, the affairs of the Association are running very smoothly, and, while this is largely due to the generous way in which members, as a whole, have given their support, it is more directly due to the enthusiastic work of your Council, and who, in turn, will, I feel sure, readily allow the togas of most excellent service to fall upon the shoulders of our Honorary Secretary, Mr. McNamara, and our Treasurer, Mr. Thompson. These two gentlemen are, if I may borrow the phrase, the staff officers

of the Association, and they are, indeed, of inestimable value to it. The innovation made at the beginning of the year of appointing a resident Assistant Secretary and Librarian has, I am pleased to say, proved most successful, and those officers whose work has been simplified by the assistance they have received, will heartily support my remarks as to the enthusiastic way in which Miss Falvey has carried out her duties.

We have had a period of activity insofar as the growth of membership is concerned, and members are to be congratulated upon the fact that, even under the distressful circumstances existing at the present time, the Association has added to its register the second highest number of new members for any year on record.

TABLE I.
GRADING OF MEMBERS

YEAR	CORPORATE-MEMBERS		STUDENTS		TOTAL MEMBERS *	% OF OTHER GRADES TO FULL MEMBERS.
1886	143		11		154	7.7
" 1896	132		11		143	9.
1906	149		26		175	17.4
	CORPORATE-MEMBERS		STUDENT-ASSOCIATES	STUDENTS		
" 1909	160		2	37	199	24.3
" 1911	187		6	53	246	31.5
	MEMBERS, ASSOCIATE-MEMBERS (CORPORATE-MEMBERS.)		GRADUATES	STUDENTS		
" 1916	153	11	12	43	226	43.
" 1917	166	15	11	58	250	50.6

* NOT INCLUDING ASSOCIATES
AND HONORARY MEMBERS.

It must, however, not be thought for one moment that an Association can justify its existence by the mere accession of members; but we are entitled to the satisfaction it evidences of growing interest in our work. This point has been further borne out by the general excellence of the papers presented during the year. In many respects, our

effort throughout the session has been towards cultivating intensively with a view to future harvests, and several of the more important matters considered I will refer to later. We have not, in the circumstances, entered into any social events, and these are so important in enriching the friendliness and good fellowship resulting from human contact that, when the shock of this appalling war is over, we must certainly take up this helpful side of our activities again.

And now, with much diffidence, I turn to fulfil my duty of presenting an address to you this evening. I assume, however, members appreciate the fact that my possibilities for usefulness to the Association lie more directly in the way of work on its behalf, rather than in any words contained in an address. It would be easier for me to follow a well-established practice of describing the progress made in that branch of engineering with which I am most closely connected; but, in these heart-searching times, I find myself indubitably drawn towards consideration of matters of more general interest, and associated more particularly with the welfare of the Engineering community. In doing so, I intend to avail myself of the custom which allows a President a good deal of license in the number and the amplitude of his digressions.

Having been called to the office of President, which I interpret to mean one of supreme service to the Association, it has concerned me very much indeed during the past year to know whether I have done everything within the scope of my power to properly direct its activities. In almost every journal of engineering literature during the past three years, and very frequently in the daily press, we have been reminded of the firmer establishment of the alliance between science and industry; we still have frank acknowledgments by Governments, war chiefs, and other authorities as to the dominant position engineering holds in the success or failure of our arms on land and sea; we

know, by the conviction born of general knowledge, and which, as engineers, we have long regarded as a fundamental necessity, that science must not be detached from, but must be woven into the very fabric of, industry, and that all bodies dealing with similar or kindred affairs must freely combine for the common good. If we know all this, that engineering is of prime importance to national life and progress, that association is necessary to improve and consolidate results, and that science must lighten any path of progress, then are we, as an Engineering Association for the General Advancement of Mechanical Science, reasonably fulfilling our objects at this critical period of the country's history? These remarks will declare to you my intention to refer, first of all, to

The Importance of Engineering Societies to Industry.

And if what I have to say appeals to you as prosaic, then I would tell you that it is entirely because I have a particularly high regard for the importance of well-established and effectively-managed engineering associations I have been prompted to bring the subject forward once more. The condition and influence of such associations as a whole are, I have always considered, subjects entitled to, and indeed worth far more attention than are now given to them. The power of such for good is surely beyond estimate. Our Associations possess many of the prominent men of the profession, leaders in our scientific and industrial life, and consequently there is available a great amount of experience and learning. Are we making full and proper use of this already organised talent and experience, and are we exerting the uplifting influence in engineering circles which the possession of these qualities should enable us to do?

The most prominent feature of our work will always be in the direction of increasing engineering knowledge by the reading and discussion of papers. This is obviously the

best available means of weighing our experience, of describing and so sharing the knowledge accruing from the organisation and carrying out of industrial and engineering undertakings, and in this respect we must always endeavour to encourage our best authorities to present papers, and our most able critics to discuss them. In these days many men will not join in the work of Associations because they have become specialists; but surely nearly everyone nowadays is a specialist, more or less, and no one can, without loss to himself, afford to shut his eyes to the progress which is being made in other branches of his profession. Specialisation is, as a rule, an economic advantage to the community, but this advantage will be largely spoiled if specialisation is allowed to narrow a man's outlook. It is important that each one of us should, at times, get the other man's vision, and only by association can we properly do this. Scientific associations, properly conducted, provide a source of education not to be found elsewhere. There are few better ways of clearing one's own ideas than by describing them to others; there are few better means of self-education upon any subject than by preparing a paper, and no better exercise for the mind than frank discussion of engineering matters. And, it may be added, the greatest benefit does not accrue to those who receive, but it is more fully conferred upon those who give.

There can surely be no room for doubt that engineering associations provide a splendid means whereby scientific ideas and opinions can be most effectively conveyed to, and worked into, the industries to which they are related; and, although we have perhaps laid on too thickly the whip of abuse for past neglect of science in its application to industry, there has not been, to say the least of it, a reasonable, let alone a perfect, connection between the two.

It has also got to be carefully considered whether the scientific associations in the past have not been too much inclined to think questions of economic interest outside the pale. If we were to be satisfied to confine our efforts merely to the reading and discussion of papers, even though these be of an excellent technical character, I feel bound to express my opinion that we would fail to fulfil our complete mission. It will be within the knowledge of most, if not all, of you, that the Institution of Civil Engineers, for so long considered almost too jealous in its guardianship of scientific proceedings, has recently altered its procedure to suit the new circumstances. Have we not got to do the same thing? I would have you clearly understand that I do not wish for one moment to suggest that we should in any way sacrifice the education of engineers as our basic function: it must always be our highest vocation; but I do earnestly believe that we could, with judicious care, greatly broaden our sphere of usefulness by discussing matters of vital moment to engineering interests, and, at the same time, absolutely eschew politics. We need in no way assume the work of unions or associations founded for what I would call lower duties.

Again, a fact which has frequently struck me in connection with our proceedings, and also that of many other societies, is the complete absence of any direct encouragement of local invention or discovery. You will know that in many of the oldest societies in the world it is distinctly expressed as one of their objects, and surely we should extend our sympathy to the development of scientific discoveries. No one, perhaps, would realise more fully than I do the dangers to be guarded against; but, at the same time, I have no doubt whatever as to our capacity to adequately guard against any infringement of our unwritten code of professional dignity. It might mean much to the country, especially at such a time as the present, and by

no means should be forgotten the help which might be legitimately extended to a fellow-engineer possessed of a useful idea, but equipped neither with the money nor the experience to place the idea to his own credit and the world's use.

Then, for a while, I would ask you to turn your thoughts in a direction which I consider is of the very utmost importance, viz., the human rather than the technical side of our activities. The Engineering profession has been stated to stand for truth, honesty, economy, efficiency, charity, brevity, and the ability to visualise those things not yet accomplished but which should be accomplished. In no other profession can its broad and underlying principles be so beneficially applied with great generality to the affairs of life than ours. The engineer is responsible for the greatest achievements of the age—his work is the very basis of comforts, conveniences and habits. How is it, then, that so many of us fail to see these principles in their direct application, except in matters having to do with physical structures? An association should foster, above all things, a spirit of esprit-de-corps, of brotherliness, and pride in the profession; successful technical work would follow automatically. It should be a constant inspiration to good and honest work, and a help to clear and lucid thinking. I am afraid we are all apt to forget at times our possibilities for usefulness along lines other than the mere application of our engineering knowledge to physical structure. One of the greatest objects of a well-organised engineering association should be the inspiration to broaden the views of its members and to encourage an appreciation of the big things in life as well as in engineering. Its meetings should first of all be useful, but, at the same time, enjoyable. The aim should not only be to make better engineers and broader men who will be able to bring to bear greater intelligence and concentration

upon the many questions urgently awaiting solution. No one can very well doubt that the profession of engineering has grown in standing, but I hold strongly to the opinion that much indeed depends upon the work of the associations as to whether progress in the future will be fast or slow. Whatever may be difficulties in the way, however, they will never be overcome by the casual expression of views. That much blessed word, "organisation," upon the power of which such institutions as the B.M.A. depend for much of their strength, is the **only** means by which action can be definitely brought to bear and results achieved.

There is still another aspect of our work upon which I would like to dwell for a few minutes. I think it will be readily allowed that there are no busier men in the community than the engineers, and so many, after attaining to positions of responsibility, find that the pressure upon them is so great as to outweigh their inclination to assume other responsibilities affecting their lives as citizens. In this respect they fail to participate sufficiently in the social or civic life of the community, with the result that there is a tendency for their characters to be narrowed thereby; and further, their well-trained lives are not sufficiently available for the broader aspects of citizenship. If there is one thing which is absolutely essential to obtain and keep alive the interest of members of societies, it is, in simple language, that they should always have something definite to do towards its welfare—some aim, apart from routine business, to elevate higher and higher the ethics of the profession they represent. Our activities outside should, in some measure, reflect the work we are doing within.

Research Work.

We have been told that one of the most necessary steps in Australian scientific and industrial research work is "that the Federal Council, through its State Committee,

should get into close touch with, and make use of, the existing technical and scientific departments, and with learned and professional societies and all organisations interested in industrial research." There is a clear call to us to remember that our responsibilities as the oldest of Engineering Associations here in Australia are great. The objects of our Association include particularly a demand for the "advancement of those branches of civil and mechanical engineering which tend to develop the resources of Australia." There is no evidence in this expression to justify limitation of our energies to routine work such as the reading and debating of papers, but a broad and all-sufficient call for endeavour to develop and encourage engineering progress as a whole. The Prime Minister has promised that the Commonwealth Government shall devote a huge sum of money towards scientific and industrial advancement. The established scientific societies are surely closely interested in this matter, because, if they possess many of the leading men of the engineering profession in their ranks, it is surely obvious that research work should not be wholly confined to Government institutions, either those existing or others to be brought into being. There is every reason why—in fact, it is our duty that we, in common with the practice of the older associations of the world, should, if possible, participate in research work of certain kinds. There is no doubt that most of this work must be carried out by Government institutions; but the history of every nation, including our own, has shown that it is most desirable for private industries to also take an active part in research work. I have no doubt, considering the representation of such in the Associations, that many large private industrial concerns would lend their willing support to any scheme of engineering research or enquiry which they may be fitted for. The basis for such work is already existing, viz., strong organisations

of engineers. But, if the Engineering Associations are going to participate in such work, then I have no doubt as to the desirability, or rather the necessity, for co-operation with the other associations in the Commonwealth. This brings me to a question which has exercised the minds of a number of engineering enthusiasts in several of the States for some considerable time, viz.,

The Co-operation of Engineering Associations.

I think it would be unwise to contemplate a reduction in number of the societies, for each one now exercises its proper function in carrying out the intense local organisation which is necessary to success in big areas. There is, however, no doubt in my mind that, until the engineers of Australia can speak with a stronger voice in matters concerning engineering as a whole in the Commonwealth, we shall never gain that place in work of a national character which our actual, though now much disintegrated, strength justifies. Here in this vast country is a population of less than six million people, and with approximately twenty engineering societies, and beyond sectional amalgamations there is no direct connection between them. How many members of this association, for instance, read the proceedings of the Victorian or other Australian societies? And yet we are all members of the same professional family, and living in the same Commonwealth. Does our present disunity indicate that we have really got a true conception of the meaning of the word? In just such a matter as that above referred to, viz., Federal Research in Science and Industry, it must be obvious to everyone with what added strength a National Society could speak and act. What is urgently required is a means whereby each society would enter into automatic co-operation with other appropriate bodies as a matter of course, and not as a special order of business. It would be futile to even attempt to enumerate some of the things that would be likely to require considera-

tion, but it must surely be obvious that, in almost everything concerning the status or standing of our profession, the combined power of a number of associations would be far more effective than that of any single one. The lines upon which a national society might be expected to develop is a matter for the consideration of the representatives of each State Association. With due allowance for the obsession caused by the war, it needs no strong sense of imagination to grasp the truth that peace will bring us face to face with tasks of reconstruction and organisation far more complex than any we have somewhat haphazardly met before and during the war. All the more necessity, then, that we should throw off the yoke of obsession, and displace indefinable aspirations and hopes by striving hard to define works that will help the country when the last shot has died away. Now, more than at any other time, should we consider seriously any development which will strengthen our Australian scientific societies. The task should not be put aside as detached from, but considered as a part of, the war itself. It is with a strong sense of duty I have been prompted to discuss this question again, and I feel convinced that if again postponed the day will not be far distant when, if we are really going to take our proper place, the necessity for amalgamation or co-operation will become very real and clamor for solution. Let us go out prepared to meet the necessity, and not wait, as we have done so often in the past, until the necessity drives us and we find ourselves faced with added difficulties to overcome.

We owe it to our country to pay attention to public policy insofar as it concerns the great national constructive works, and the time, I believe, will come when those who have been specially trained in engineering will be chosen for more of the executive positions controlling such work. The war has shown that Engineers and Chemists have been the greatest factors in the contest for or against world suprem-

acy, and that they have had very little to do with the management. This is not because the Engineer has not the ability, but partly because his education in the principles of ordinary business have been insufficient and partly because he has been too much inclined to consider it beneath his dignity to come down from science to more mundane things.

Our Own Association.

While putting out a plea for the encouragement of greater co-operation between the Australian Engineering Association, are we satisfied that everything possible has been done within the State to obtain the full value of co-ordination therein? To some extent only can I find a reply in the affirmative. We are certainly on the most harmonious terms with the other societies, public departments, and undertaking; but that is not nearly enough! I cannot help expressing strongly the feeling that there is insufficient fraternisation amongst us. I know this is not the result of any desire for aloofness, but purely the outcome of insufficient opportunity.

In offering the use of our reference library (which is rapidly being built up to a state of considerable usefulness) to the other kindred societies, it should be acknowledged as a step of encouragement to greater friendship. I am sure we do not stand to lose dignity, but rather to gain prestige, by our action, and it may be a stepping stone to greater things. If you will allow me to tell you a dream of the future, I would say that I picture the time when every scientific association in our midst is housed under the one roof, and in this building is established a general library, a reading room, and even a restaurant, in which members might experience something of club life, spending their spare time in mingling with their fellow professional men. Such a scheme would surely draw kindred spirits together and break down that individualism which, from the general

point of view, we must surely recognise is bad, and establish in its place a means of automatic co-operation, without which we have ample proof our progress professionally will be slow. I contend it is not outside the bounds of reason to suggest that a part of that vast sum which is to be devoted to science and industry could be very profitably spent upon furthering such a scheme. Let there be a Science House, the headquarters of the State Committee for Research, and also of the Scientific Societies. Perhaps my enthusiasm for the importance of the work of scientific associations is not sufficiently balanced by a reasonable consideration of profitable results, but I do not think that is the case. If we steadily maintain our efforts to attain to such a position of usefulness in the sphere of Australian science and industry, as the eminent associations in Great Britain have done in British affairs, I believe we would earn our right to endowment by the Commonwealth Government and recognition of us by it as integral parts in the plan of Australian industrial progress. If to engineering, broadly speaking, is due the honor of the world's industrial progress, then to the scientific societies, in whose keeping is very largely the dignity and the status of its professional leaders, and which societies should be a keystone of the arch of science and industry, are due a larger share of public recognition. We do not want to be relieved of our financial responsibilities; that would, I think, be fatal to efficiency, but there is no doubt that the state would get much more out of its organised professional men if such a plan were adopted.

In what direction can the Engineering profession look for assistance to obtain fuller acknowledgment of its true place in the scheme of things if not to the societies composed of its representatives in every branch of the science? Whether it be by better organisation of the educational functions of our societies or by elevating the thought, the

ethics, and the ideals of the profession, we are in either case bound to gain strength. Each of us must be vigilant and enthusiastically strive for such a purpose, but individual effort will never convey to the community the conviction carried by a representative corporate concern. Then let us do something more; talking it over and over again will lead nowhere. The word which carries the full effect of my meaning is again "Organisation." It might mean much for us if we believed in it and acted up to it. I do think just insofar as we bring the spirit of co-operation to bear upon our work shall we make progress and be contented.

Membership Qualifications.

Anyone who has paid even a brief visit to other large countries, and has had the opportunity of judging the influence the prominent engineering associations in those places exert, there is left with him an indelible impression. Some day, and very soon, I hope, we must exert the same influence here, and one of the greatest factors that will contribute to such is to gradually build up and to hold inviolate our qualifications for membership, and, until we can obtain greater status by registration or some such means, there appears to be no other way by which we can guarantee the standing of engineers and their qualifications for certain work. The Council of this Association has in this matter a most important trust. Enhanced qualifications should never be viewed as a desire on the part of a few to keep close the honour of full membership, but they should stand out as pilot lights of inspiration to the younger members to make full use of educational facilities and experience in practice in order to attain to the honour. Although the experience of all Engineering Associations seems to be that certain of its members do not wish to take part in its proceedings, it must be realised that, in the case

of members of lower grades, it makes it more difficult for Councils to judge of their qualifications for elevation to the higher grades.

Our influence as engineers still suffers grievously from the laxity with which the term of "Engineer" is applied; but it is certainly not the public's fault, it is more our own. The popular conception of the engineer seems to picture him as always having some tools of trade in his hand. The enlightened know that this is quite wrong, but until some sure means can be devised whereby the difference between the mechanic and the professional man can be absolutely determined, we must face the disability of the levelling power of the word "Engineer" and go on steadily educating people to think of us rather in terms of that part of us which goes into our work. In time, then, let us hope it will be more generally understood the difference between the functions of the craftsman with his tools and the expert in cause and effect. Engineering in its elementary works certainly uses mechanical methods in its expression, but these methods, properly understood, are entirely subordinated to the chief functions of the engineering mind, which is essentially judicial and reasoning in character. Pure science concerns itself with discovering laws of nature. The engineer, although often concerned with purely scientific work, mostly adapts this to the use of man; we are, in common with the bulk of most of the other professions, students and interpreters of science. Now, although registration is looked to by many as the *only* way by which the standing of the engineering profession will be raised, I am inclined to believe that it may not prove to be thoroughly effective in doing so, unless, by the greatest wisdom, incompetent men can be debarred. With the broad meaning now applied to the word "Engineer," it is fairly obvious that it would be impossible to legally debar the use of the term to the incompetent or unscrupulous. At all events, let us

clearly remember that it is very largely through the engineering societies, by strictly observing well-framed qualifications, there now lies the only way of registering and classifying what may be accepted as professional engineers, men scientifically trained and with the important additional asset of extensive practical training. Our standing in an Association should be a true estimate of our quality by those best able to judge, viz., those within the profession; then the public must be brought to understand the difference in value of engineering service. Let us, above all else, remember that whatever uplifting is to be done must come from within the profession; it cannot be expected to come from without. All professions are expected to guard their own interests, and those which are too indifferent to conserve theirs will not bring about concern on the part of others.

It has been disappointing to officers of this Association for some time past that it has failed to attract a greater number of engineers from the Public Service, and at such a time as the present, when many men are fretting because of their inability to carry a greater share of the Empire's burden, it seems to me that interest and active participation in the affairs of Associations working directly for progress, now for the sake of bringing to a successful conclusion, and afterwards because of the effects of the war, provide an opportunity for the application of their energies. To put the matter in prosaic phraseology, the Engineering Associations are here for "the common good of Engineering," and, if ever there was a time when engineers should sink individual prejudices and realise that they are shareholders in the greatest corporation that the world has ever seen, it is now. It appears to be dawning upon Government authorities that engineering and technical organisations provide an excellent means of disseminating knowledge and information. One can see this in Great Britain, where the

engineering societies are more active than before the war. Here we have not felt the full effect of this movement; but, when the so-called industrial war takes up the battle in place of arms, then we shall surely feel it. For this, and many other reasons, we want the Engineering Associations to grow in strength and to acquire many more of the well qualified men from the Public Service. It would seem obvious the mutual benefit which must result from the interchange of ideas between the engineers of our Public Service and those in private organisations. We can all readily acknowledge the high ideals of the Public Service Engineer, and it is our duty to see that he is rendered sympathetic support, but we could do this far more effectively if we came into closer personal contact with him than circumstances at present allow. Again, perhaps it will be admitted that from those engineers who are responsible for the efficiency of organisations controlled by private enterprise, there is much that the Public Service Engineer could learn. There is really no room for aloofness by any individual. On the contrary, we should realise—and the sooner the better for the general prosperity of the country—that we are all tied together more or less by the same necessities of life and by a unity of interest. In plain words, we are a people, and not an assortment of individuals, each one with a different idea or object. Individual efficiency is effective only when the person has a master mind. Not only in war, but in peace, the time has come when each one of us must consider, not what he would rather do, but what he can best do towards increasing the overall efficiency of the nation. I feel so keenly in this regard the possibility of greater usefulness of the Associations, I would say that no professional man in the community can be said to be doing his duty to the State unless he is devoting some of his energy towards the welfare of one or other of the scientific societies. Our work is no doubt open to criticism; we are,

I hope, reasonably imbued with humility, and we want always to hear of suggestions for improvement. It is often said that engineers are insufficiently broad in their outlook and insufficiently equipped to interpret their work for the benefit of the public, and, perhaps, in no other profession is there more general complaint as to the want of proper appreciation by those upon whom our work is bestowed in every walk of life. But what is the use of our complaining unless, coincidentally, we vigorously endeavor to instruct the ignorant and to raise our status by united action in the direction of encouraging education and cultivating the gift and power of expression? It is not with any desire for glorification of the Association that I speak in this way, but in order to ensure a greater demand by the public for the more efficient use of men whose training fits them for helping in the administration of our great public utilities, and in educating the public up to a right perception and a proper appreciation of engineering problems, and, not by any means the least, a proper appreciation of the value of their engineering services. It is really for such like reasons that Associations exist, for they provide the very best means of expressing the things that are exercising the thoughts and attention of engineers.

Let it not be thought that I am in any respect whatsoever unaware of our present position. I think it is generally acknowledged, both from without and from within, that, as a result of the labors of the many able and earnest men who have controlled the affairs of the Association in the past, it has made, and is continuing to make, definite progress. Our activities are spreading, and we are slowly gaining a more generally recognised position of authority in matters of public engineering interest. We are maintaining our demand for better qualifications for membership, and which are being recognised in the proper spirit by prospective members. It is, however, particularly those