every member of the Institution. He would be free to present papers at any meeting and join in all discussions. There would thus be provided a great opportunity for closer relations. Then in the Committees, upon which would be represented every branch in a State, there would be another opportunity for the development of better fellowship, and finally in the Council of the Institution in which representatives from every State would meet. What value can we put upon this aspect of the matter? I would say it is inestimable from every point of view.

RETENTION OF SCOPE OF EXISTING SOCIETIES.

You will see, when the draft constitution is before you, that there has, as far as possible, been retained for the existing associations their present scope. It has been most definitely expressed from the beginning of the movement that no association should lose its identity, each one retaining the right to become a branch of whatever section its interests best fit it, and every member of an associating Society may remain affiliated with the branch formed by his Association.

All property, funds or endowments shall remain the property of the branch formed by an associating Society, unless, of course, such branch should desire to transfer such to the Council of the Institution. It was mainly because of the desire to refrain from anything in the nature of breaking down the existing associations that the proposal made in certain quarters to found an entirely new institution to which those who desired might transfer was not seriously entertained. It was thought wiser to bring about closer co-operation by building upon that which existed as a foundation, a finer edifice, wherein the aim must be to ensure the engineer that proper recognition in position and influence which, judged by his accomplishments, is his due. If there was the opportunity to begin and build anew, it would have been an easy task to provide a suitable consti-

tution, but, nevertheless, I fully believe that the one to be presented to you for acceptance will prove workable and effective, that it will provide fully for the various interests concerned, and at the same time leave a way open for the evolution of more simple machinery should experience prove such to be necessary. It is almost needless to remark that in drafting the constitution there has been kept in mind the need for elasticity enough to allow for a change in methods if necessary.

THE IDEAL CONSTITUTION.

I would, however, say that, although I fully recognise the impracticability at the present time, the constitution we should keep in mind is the ideal one which we would draw up if there was not a single associating Society and no unusual interests to be considered, for we must hope that time will entirely eliminate the old atmosphere surrounding the idea of separate societies. Personally, my desire would be to see swept away everything tending to perpetuate the system of barriers between the engineers of the Commonwealth now existing, for the sooner we set out to interpret the meaning of the word "Commonwealth" in its application to this movement the better. There will always be special branches, and their interests must be provided for, but I am convinced that several of the societies that now maintain separate organisations could, very profitably to all concerned, be united. In considering this question later, it is important that members carry this aspect in mind.

THE MAINTENANCE OF THE PROPOSED INSTITUTION.

Then, gentlemen, if we desire to see established an institution fully representative of the profession, one carrying an unassailable status and thoroughly well equipped to express its work to the outside world by its scientific attain-

ments and its transactions, then we must be prepared to subscribe liberally for its maintenance. One has only to consider for a moment the expense of management of any organisation here in Australia to at once realise that, in order to maintain the proposed vastly superior institution in a manner commensurate with its importance, it would be quite impossible to do so with the rate of subscriptions of any of the present societies. Examine in the list given in the earlier part of this address the subscriptions to the institutions outside Australia, and remember that the total membership of these, as a rule, runs into many thousands, and that many are heavily endowed, and it will at once be seen that the subscriptions proposed for the new institution, are, in comparison, quite moderate.

THE TRANSACTIONS.

With regard to the Transactions of scientific societies, it is worth noting that there is a very strong feeling developing in Great Britain and elsewhere towards coordinating the proceedings of various institutes. One has only to think of the overlapping which now occurs, and the great quantity of matter which one is unable even to peruse to realise the advantages of having one representative set of Australian Transactions, in which would be included in full the best of the papers presented, and an abstract report of all papers read. It is to be assumed that each branch would keep a permanent record in full of all papers read, and it should be quite an easy matter to arrange for a member of any branch to obtain a full copy of a paper of special interest to him.

THE ESSENTIAL POINTS TO BE REMEMBERED.

And now, generally speaking, I would say that there is agreement by all concerned that the existing associations have done excellent work within their necessarily prescribed limits, but it has, at the same time, been unanimously and

enthusiastically accepted by representatives of every association in the Commonwealth that co-operation is desirable. Then, if this fundamental fact is acknowledged, surely it behoves us to set about the business in the manner thought best by the great majority, viz., by amalgamation. We must keep the essential points in view, and relegate everything else to a secondary position, concentrating our attention on those factors that will most certainly contribute to the desired result. This is the one thing which, broadly speaking, should concern us at this juncture. If we delay matters because it appears to some that the ideal way is not being taken, I would say that I have no doubt whatever that a sensible body of men, filled with the highest motives, are not going to commit irretrievable blunders. Anomalies may occur, but will be swept away by the process of time, and we surely have a high enough estimate of the constructive ability of our fellowmen to know that mistakes will not be tolerated long. No body of men are quicker than engineers to profit by their mistakes. It is a difficult matter to obtain absolute unanimity in a large body of people at any time, but considering the great area covered, and the various constitutions of the societies, it is perhaps a unique occurrence to have it here now in Australia with regard to the necessity for co-operation. The opportunity is one not to be missed. The war has demonstrated clearly and beyond doubt that in relation to the value of the various professional groups constituting the nation, efficient engineering service is one of the very most essential. We are being afforded a great and increasing opportunity. As engineers we should be as potent in peace as we have been in war. Are we really answering the call, and standing to attention in the new ground, or are we standing at ease in the old, Is our house really in order for the urgent work required of us now, and for the testing time of the years immediately following the conclusion of peace? We must surely,

in this matter, concern ourselves closely with the commercial future of the Commonwealth, for we stand in the forefront with those who can help or hinder it. We want to raise the profession of engineering so that it will attract a far greater proportion of the best men in the community, assuring thereby a supply of trained technical officers for our industries. We can take from the tragic examples of the war endless warnings that we will have to do more than we have done hitherto, and we can most efficiently do more by unity of purpose of the engineers throughout the Commonwealth. It is the age of concentration of effort, and this applies universally. There is no room for narrow views upon this question. It is not one as to whether this or that society stands to lose some of its independence or its prestige as a society, for we owe nothing in the way of allegiance to a society, surrounded though it may be with sentiment and tradition, if such allegiance interferes with national efficiency. Where would the nations fighting for right and freedom be if they had not co-operated and sunk their individuality for the sake of unity? Still pottering on. And that is where I am convinced we will find ourselves if we fail to follow the obviously right course. There is no room for suspicion that any Association has in mind the absorption of any other, or the deprivation of their existing rights; for during both Conference and Council meetings there have been very evident signs to the contrary.

THE NATIONAL IMPORTANCE OF THE MOVEMENT.

I can conceive of no movement so pregnant with possibilities for the improvement of the engineering profession here in Australia; none so likely to develop a nation-wide understanding of, and sympathy with, one another; none that would bring to us a clearer realisation of the power and influence for good that we might, but do not, wield in

the community. If we are to move on to the forefront of the professions, there is no doubt that we must think in broader channels, and lift our vision up to something higher and more generous than we have done hitherto. We must endow our object with infinite possibilities, and bring to it those human qualities without which our work will be stultified. Whatever success attends the movement will depend solely upon the enthusiasm we, who are highly interested in the matter, put into the business. Being profondly stirred by observing the value of co-ordination in so many ways during the past few years, I do hope that everyone concerned will take up this matter as one concerning his very existence professionally, and be prepared to change or adapt himself to the changing circumstances of the times.

THE FUTURE OF THE ENGINEERING INDUSTRY.

The past year has been a notable one from the point of view of engineering development. The Trans-continental Railway was opened to traffic, two huge modern power-houses have been set to work, contracts have been placed by the Commonwealth Government for some 50 sea-going steamers, aggregating about 150,000 tons, and the cruiser "Adelaide" was launched in eight months from the time the keel was laid. These typical events surely entitle us to mark on the 1918 mile-stone in large letters the word "Progress." And how much more could be written of events which, though of less outstanding importance to the public mind when weighed in the balance by those who understand their portent, provide a greater source of satisfaction, constituting, as they do, giant strides towards the independence of Australia in the manufacture of the sinews of the nation—its metal products. Who, before the war, even though he allowed for the inevitable spur of war, would have thought it possible that at the present time we would

be in a position to turn out approximately 4,000 tons of foundry pig iron per week; 7,000 to 8,000 tons of finished rails per week; 200 to 300 tons of steel castings per day (up to 40 tons in weight); structural steel of every merchant shape and size; steel, iron and yellow metal rods, drawn wire, steel and zinc plates, copper plates and tubes, etc., etc., and a multitude of manufactured articles built up from the above raw and partly manufactured materials? And are we not assured that millions of capital are ready to flow into the industries of the country as soon as peace is declared, and engineers will be called upon in greater numbers to fill not only technical, but also many of the executive positions in connection therewith. The engineer would bring to such problems a mind better trained to successfully grapple with, and solve, that question which many believe will be the greatest anti-war problem—the bringing about of a better understanding as to the meaning of the terms "capital" and "labour." The two things are not antagonistic really, but because labour is human, and capital material, the false belief that the two are opposed to one another is played upon by extremists who know that sympathy will flow almost invariably to the human side. It is not my intention to enter into a discussion of this matter, but I do believe that the main trouble is because of misunderstanding of the basic laws of the universe, and largely the application of a wrong meaning to certain terms and phrases.

It seems, to say the least of it, quite probable that great developments of the existing and of new industries will take place, and it certainly appears to me that the application of science to such industries will be the more urgent necessity than the question of scientific research. This brings me to a matter which has recently seriously disturbed the minds of engineers here in Australia, viz., the proposed constitution of

THE BUREAU OF SCIENCE AND INDUSTRY.

The present Director, a commercial man (the appointment being rightly made in order to obtain a man of business organising ability), recently announced that two other directors were to be appointed, one a chemist and the other a biologist. The Director has been approached, and strong representations made to the Acting Prime Minister, for the feeling is unanimous among engineers that the omission of a representative of our profession from the directorate will not only constitute a slight to the members, but, what is more important, will tend to prevent the Bureau from fulfilling its designed functions in a commercially successful way, and this, I take it, is the essential requirement of the establishment. By all means retain the chemist and the biologist, particularly the former; but, in view of the Prime Minister's clear statement that the purpose of the Bureau would be mainly to foster the application of science to industry, there are very few men indeed who would not admit that a well-trained engineer, and particularly one who had had extensive connection with industrial establishments, would be probably the most essential professional member of the directorate. To form the directorate of the Bureau without the direct representation thereon of an engineer will, to say the least, certainly depreciate tremendously the possibilities of its being successful. No one can suggest that the engineers of Australia have failed to observe their national obligations, and let it here be clearly noted that by engineers I mean the professional men, and not the mechanics, who, through the unfortunate mis-use of the term "engineer," are so often confounded with the men of the profession. The trouble hitherto has been that the engineers have sunk their individuality too much, with consequent detriment to the esteem in which the profession is held. Otherwise, if a true conception of their usefulness was publicly held, the

suggestion to omit an engineer from the directorate would never have been made. If the directorate is formed without an engineer, the Bureau is certainly setting out to kill the enthusiastic interest of some three thousand men of one of the greatest constructive professional groups, directly concerned in practically every industry in the country.

This is not a case of professional jealousy, but a claim for a commonsense ruling. I would repeat that at the present critical stage in our history, it is of far greater and immediate importance that the Bureau should devote the bulk of its time to our manufacturing industries, which hitherto have suffered for want of science in their methods.

ROADS.

Another glaring instance of the lack of appreciation of the engineer was furnished when a prominent Australian politician recently announced that laymen should fill the principal posts in the proposed Roads Board. They certainly have held the reins hitherto, and their work stands as a monument no one else will have any desire to claim credit for. Good road making is of prime importance in this continent of great distances, but good roads can only be made by men who understand the principles involved, and one of these principles is that high first cost, as a rule, means low maintenance, and consequently low overall cost. The good old adage, "A penny wise and a pound foolish," cculd surely be erected as the sign-post at our street corners to point the way that failure came. If more success is to be obtained, then the professional man who understands the business, and knows the cost, should have a greater say as to the way in which the country's money should be spent.

POSTAGE ON SCIENTIFIC PUBLICATIONS.

Again, it should be clear to everyone that the Scientific Societies' Proceedings form a direct link in the chain of science and industry. It is, nevertheless, an unfortunate fact that such publications are treated by the Common-

wealth Government as printed matter, simply because included in the transactions, as a matter of convenience, are copies of Council's reports, balance-sheets, library catalogues, etc. The catalogues of business firms, which exist for their own benefit and profit, are treated more liberally than the Societies' Proceedings, which are published solely for the dissemination of literature for the advancement of science, and therefore for the benefit of the whole community. The matter involved cannot be of great importance to the Postmaster-General, but it is of relatively great importance to the Societies, which are maintained by the annual subscriptions of members.

REPATRIATION.

Our duty in regard to this national matter is clear: we must throw our full weight into any scheme that may be devised. We have offered to form Honorary Advisory Committees, and, although it is not yet clear just how our efforts can best be used, if a way does not shortly open we will not wait for the busy men who are handling this matter to devise, but we will set out to create it ourselves, knowing, perhaps, best just how we, as engineers, can be most useful.

REGISTRATION OF ENGINEERS.

That registration is necessary for engineers is generally admitted, but I feel that, although we would be glad to see a measure introduced immediately, if it does not come about at once we could more certainly bring it about if we had the united force of the engineers behind our appeal. For this reason the matter might well wait a little longer; but it must not be assumed that, because it is not being strenuously advocated at the present moment, our enthusiasm has waned.

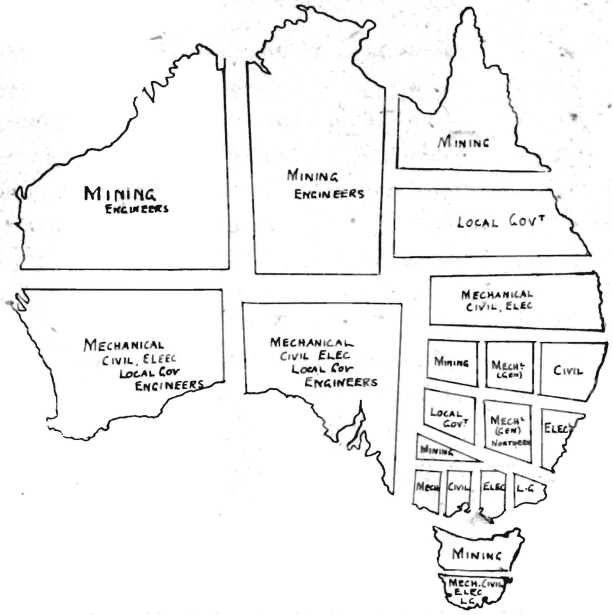
THE NEED FOR UNITY OF ENGINEERS.

The above few instances serve to show that there is an infinite work ahead of us in educating the public to understand and appreciate the place the engineer should occupy.

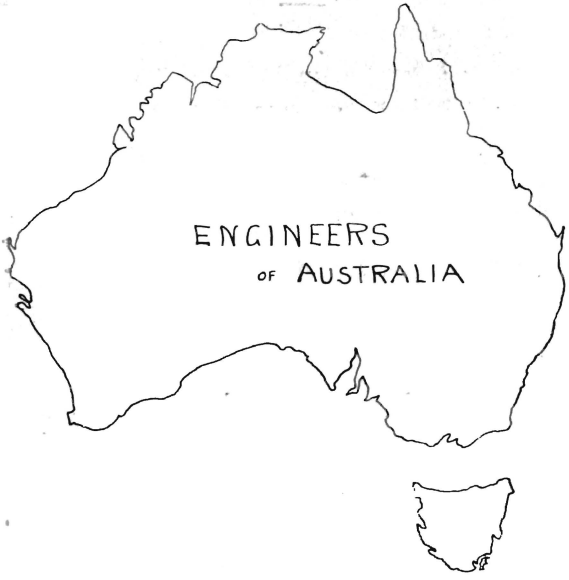
We look to the newspapers of the country, to some extent, for co-operation, and I have no doubt that if we satisfactorily demonstrate to them that our desire for their co-operation is not based on the obtaining by us of personal advantages for the engineers, but rather that our concern is for the national welfare, we may be sure that their patriotism would lead them to give us such help.

CONCLUSION.

I would conclude with an appeal to every member of the Associations to ponder deeply over the proposed amalgamation scheme, to look ahead to the time when Australia will have a population many times larger than at present, and to realise that a mistake made now will be increasingly difficult to correct as time goes on. Let us keep uppermost in our minds those self-imposed barriers that now exist between engineer and engineer in Australia, and which, if swept away because of their obvious hindrance to national efficiency, would enable us to cultivate truer national instincts, leading to the development of an institution in which we would be, not members of a section of the profession within a State division, but, in truth and earnest, Australian engineers, members of a force which, without co-operation, cannot succeed, but with co-operation cannot fail.



AUSTRALIAN ENGINEERS AS NOW ORGANISED



AS THEY SHOULD BE ORGANISED