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Engineering Prospects in Russia.

BY MR. JAMES ANDERSON (Member).

READ

*Tuesday, October 5, 1915.*

CHAIRMAN: MR. GEO. ADAMS (Chairman of Council).

The CHAIRMAN: The title of the paper for this evening differs somewhat from the papers usually read at our Institute meetings, inasmuch as it deals with engineering prospects in Russia rather from the commercial than the technical point of view.

At a time like the present, our attention is centred more or less on Russia and the part she is taking in this great war, when we hear that some of the reverses which she is suffering are attributed to a shortage of munitions mainly due to scarcity of factories for their manufacture, we shall be interested to hear the result of observations on engineering matters from one who has so recently visited the country.

I understand Mr. Anderson has travelled considerably in Russia, and although I do not know which of the many-sided phases of engineering he will take up, it is quite possible Mr. Anderson may have many points of interest for the Marine Engineer.

At present when many of our theories of a year or two ago have been cast aside as untenable under the new conditions which obtain, it is interesting to turn to an authority on political economy to see if we may get any light or leading from a perusal of his writings. Adam Smith, in Book IV. of "The Wealth of Nations," has the following:—"It is not always necessary to accumulate gold and silver in order to enable a country to carry on foreign wars, and to maintain fleets and armies in distant countries. Fleets and armies are maintained, not with gold and silver, but with consumable goods. The nation which, from the annual produce of its domestic industry, from the annual revenue arising out of its lands, and labour, and consumable stock, has wherewithal to purchase those consumable goods in distant countries, can maintain foreign wars there.

A nation may purchase the pay and provisions of an army in a distant country three different ways: by sending abroad either, first, some part of its accumulated gold and silver; or, secondly, some part of the annual produce of its manufactures; or, last of all, some part of its annual crude produce.

The gold and silver which can properly be considered as accumulated or stored up in any country, may be distinguished into three parts: first, the circulating money; secondly, the plate of private families; and last of all, the money which may have been collected by many years of parsimony, and laid up in the treasury of the prince.

It can seldom happen that much can be spared from the circulating money of the country; . . . . Something, however, is generally withdrawn from this channel in the case of foreign wars." Note the next remark: "In the present times, if you except the King of Prussia, to accumulate treasure is no part of the policy of European princes." . . . .

"The profits of foreign trade indeed, were greater than usual during the whole war, but especially towards the end of it. . . . The commodities most proper for being transported to distant countries in order to purchase there either the pay or provisions of an army, or of some part of the money of the mercantile republic to be employed in purchasing them, seem to be the finer and more improved manufactures; such as contain a great value in a small bulk, and can therefore be exported to a great distance at little expense. A country whose industry produces a great annual surplus of such manufactures, which are usually exported to foreign countries, may carry on for many years a

very expensive foreign war, without either exporting any considerable quantity of gold and silver, or even having any such quantity to export." This was written after one of Britain's great continental wars and seems to sum up the present situation so accurately as to be almost of the nature of a prophecy.

Before going further into the question of foreign trade openings, it may be well to consider the dislocation of the labour market which has been brought about by, first, the withdrawal of some of the best of artisans from the factory to the fighting line; secondly, by the withdrawal of others to the factories which are engaged on Government contracts for the supply of munitions of war. Owing to the second of these and the large demand for raw material for the supply of these munitions, there is a great difficulty in getting delivery of finished products to export. The problem is to find out how and where to, goods may be exported. Let us reverse the process and look around for a suitable market and then consider how we may supply that market.

In the search for a new market it is desirable to look first to those countries which lie close to hand. The reason for this is obvious, as all costs connected with the transport of goods to them are so much reduced. Freight is usually less, correspondence takes a shorter time to pass between the contracting parties, and under certain circumstances the payment for the goods is made in a shorter time, all of which help to facilitate trade. Should bad debts unfortunately be contracted it is a simpler matter for a principal to attend to their recovery in person at comparatively small cost. Principals may make a business trip among their customers at more frequent intervals without absenting themselves for too long a period from the chief scene of their activities. In other words it is easier to keep in touch with one's customers and their requirements, without losing touch with the general course of office and works production. Having fixed upon some country or group of countries, it is then necessary to examine their needs for the particular line of business which interests the investigator. Having discovered that there is a demand for some particular manufactures, it is then requisite to determine how these demands are being met. Are the home manufacturers capable of supplying all the requirements both as regards quantity and quality? If not, where is the supply derived from, in what quantity and quality? If the amount of these imported goods is large, could the investigator import goods of a similar or better quality at the same or a cheaper price? It might be as

well to find out also if the type of article being imported is exactly what the buyer desires in every way, or has he some hankering after a slightly different thing.

As engineers, we are naturally most interested in machinery, and by applying the foregoing rules let us see if there are any markets which might be worth capturing and cultivating. It must be remembered that the times are abnormal just now, and two large competitors are cut off from exporting, in many cases, thanks to our Navy. Of all the countries in Europe, the one which is most undeveloped, but which has most scope for future development is, undoubtedly, Russia. Russia is near to us geographically in normal times; being a developing country there is bound to be a demand for engineering manufactures, and a study of the following statistics will prove that this demand exists, that the internal resources of the country are not equal to supply that demand, and that this demand has been, in the past, met by the countries which are now unable to export to Russia. It is seldom or never that a competitor is cut off from a market so completely and effectively as Germany and Austria are at present.

The following list of imports into Russia is taken from the official Board of Trade returns and will give an idea of the magnitude of the engineering and allied trades imports:—

| Description.  | Germany.  | Austria. |
|---|-----------|----------|
|   | £         | £        |
| Electrical appliances and apparatus, including dynamos, lamps, and power transmission parts ...   | 968,000   | 58,700   |
| Internal combustion engines, steam and gas turbines, in combination with dynamos, pumps, and blowing machines, and individual parts for these ... | 654,000   | 5,000    |
| Implements and tools ...  | 1,005,550 | 169,900  |
| Brass and brass wares ...   | 664,300   | —        |
| Machinery belting ...   | 202,400   | 4,930    |
| Pumps and pumping machinery ...   | 91,850    | 1,630    |
| Printing machinery ...  | 156,750   | 570      |
| Machine tools ...   | 595,550   | 8,650    |
| Road locomotives ...  | 334,300   | 44,600   |
| Engine and boiler packing ...   | 12,300    | 13,080   |
| Tubes, pipes and fittings ...   | 187,000   | —        |
| Sewing and knitting machines ...  | 453,600   | —        |
| Motor cars and parts ...  | 687,850   | 101,350  |
| Agricultural Machinery ...  | 938,200   | 315,800  |
| Textile machinery ...   | 322,600   | 10,260   |
| Milling machinery ...   | 204,500   | 7,615    |

This list must not, however, be taken as showing all the imports into Russia of those goods which are of most interest to the members of this Institution, but merely to show the magnitude of the trade generally.

It is clear from the foregoing that there is a great opening for supplying goods to Russia, and the next step is to discover whether this demand will be met by the home manufacturer, in Russia, or by importing from some other countries. So far as supplying the demand by home products is concerned, it is very improbable that Russia, in the course of a life and death struggle, such as she is at present taking part in, will have the means if she has the power to organise new industries. Even if new works are to be started immediately, it is necessary to import the new machinery, if the new works are not to be delayed until such time as will allow for the organisation from the very start of all the trades and manufactures necessary to make the country self supporting internally. Where, therefore, is she to look for this initial supply of the means for equipping the new works? The various sources of supply from which she may draw, are, the neutral manufacturing countries adjacent to her borders, namely: the United States of America, Norway, Sweden, and Denmark, the Allies (Great Britain, France, Italy, and Japan), not to speak of the Dominion of Canada. Of these the Scandinavian group, the United States and Japan are our most serious competitors. Russia herself looks to this country for the future supply of those articles which in the past has been drawn from Germany and Austria. An article which appeared in the journal of the Russo-British Chamber of Commerce, states the case from the Russian standpoint, and it may be of interest to quote an extract from the article which is headed "The Future of Anglo-Russian Trade."

#### THE FUTURE OF ANGLO-RUSSIAN TRADE.

"What will be the result of the war on Anglo-Russian trade is a question to which there should be but one answer. Of the outcome of the war it is unnecessary to speak, for all considerations are based on the inevitable victory of the united forces of the Allies.

The outstanding feature in the commercial situation is the dominant position hitherto occupied by Germany, largely as a result of the Commercial Treaty of 1904, so favourable to German interests. With the assistance of a conventional tariff which permitted German goods to enter Russia under a reduced

customs duty, and backed by the push of a network of agents who are instructed to give long credit terms, Germany has secured more than the lion's share of Russian trade, and in some branches almost a monopoly.

The question before us is, "How, after the conclusion of peace, will Russo-German trade be changed?" There is no doubt that Germany will put forward superhuman efforts to re-establish her connections. Her merchants will but increase their proverbial pushfulness to overcome the temporary aversion to German goods. It is for the British merchant to take advantage of the opportunity to wrest the Russian trade from Germany, and while it is possible that he will be assisted by facilities from the Russian Government in the shape of preferential customs' treatment, yet this preferential treatment will hardly be sufficient in itself to assure the sale of British manufactures in Russia to the extent which is warranted by the relative capabilities of England and Germany to supply the Russian market.

British merchants and manufacturers will have to become less conservative in their business methods and profit by the lessons of Germany's progress, a progress largely based on credit terms, which the Russian buyers expect and obtain, and a free use of commercial travellers who speak Russian. There is no need to overlook the fact that a great incentive to Anglo-Russian trade would be given by an alteration in the Russian commercial law according greater security for industrial enterprises and capital investments.

Business with Russia is as safe as with any other country provided the usual business precautions are taken."

Further proof of the opportunities of trade with Russia are contained in an article published in the *Commercial Review* for August, 1915, and written by E. Geo. Roberts.

#### GERMANY'S PREDOMINANCE.

"Prior to the war German exporters supplied Russia with goods to the value of between £50,000,000 and £60,000,000 annually, while Russia's exports to her neighbour were but little less. Germany had, in fact, by her perseverance and characteristic thoroughness, obtained a tremendously predominant hold upon the Russian markets, in many cases establishing virtual monopolies for her industries. Russia has had no valid reason for discouraging this enterprise—rather the reverse, for her avowed policy of wide economic development has

been admirably served thereby, as is shown by the position she now occupies amongst the great trading nations of the world as compared with that of a few years ago."

"It now remains for us to centralise our energies upon the task of filling the gap in the Russian markets—which the complete cessation of German and Austrian trade has left—in a manner worthy of the highest traditions and aspirations of British trade and industry.

There are a number of points which need to be inculcated in connection with any attempt to capture the Russian markets, some of which are peculiar to the country. In the first place, matters should be put in hand immediately. Great Britain is not the only nation which has covetous eyes upon German's lost heritage in the East; Americans, Scandinavians, and our Allies in the field are all watching keenly and organising their resources to meet any and every demand. Secondly, Germany's commercial success in Russia, as in other countries, has been secured with the aid and co-operation of the hundreds of thousands of German settlers in that country to whom the Government at Berlin has wisely granted every facility for retaining their nationality and keeping in touch with business circles at home.

Added to this, there is the need for a better British consular service in order that the nation's foreign trade interest may be properly supervised, this being a question which demands greater consideration with regard to Russia than perhaps any other country."

(Article by E. Geo. Roberts in the *Commerical Review*, August, 1915).

At present there are three routes for the importation of goods into Russia. The first is that by which the mails, and most of the passenger service from Europe are carried over. This is by way of Norway and Sweden, through Finland. The second way is the Archangel route, and the third is by the Trans-Siberian Railway. The Scandinavian route takes six to seven days and nights continuous travelling to reach Petrograd from this country. The worst feature in this way of entering Russia, is the break in the railway system at the north of the Gulf of Bothnia, where the frontiers of Sweden march with those of Finland. The Swedish railway ends at a little village called Karungi, from which point it is necessary to drive about three kilometers to the Finland railway terminus at Karunki.

The difficulties of the Archangel route are evident to all, as it is only a summer port. Even in summer there is bound to be confusion, as it is the only western Russian port open to the rest of the world. So far as the Trans-Siberian route is concerned, it is out of the question, so far as this country is interested, owing to the long sea voyage to the eastern end of the railway at Vladivostok. Should the Dardanelles be forced in the near future, there will be another door through which Russia may be supplied and by means of which she may export her surplus products.

In the extract from the article on the future of Anglo-Russian trade which has been quoted above, the writer of the article states "Business with Russia is as safe as with any other country provided the usual business precautions are taken." This is of course perfectly true, but it must be borne in mind that it is more difficult to obtain information regarding the status of customers, owing to the length of time it takes to get replies to one's queries. The final paragraph in the other extract is also a statement which requires some qualification. So far as my own experience of the British consular service in Russia went, it can only be said that each and every one of the staff with whom I came in contact, without exception, went out of their way, and seemed to think it no trouble, to give me every assistance. I am glad to have this opportunity to express publicly, to them, my thanks for all the kindness and assistance bestowed on me while in Petrograd.

If any considerable portion of Germany and Austria's trade is to be diverted into British channels, manufacturers and merchants in this country, will have to alter their methods to suit the Russian market. This is a point which cannot be too strongly insisted upon. Firstly, catalogues and price lists must be printed in the Russian language; weights and measures must be in familiar units, preferably Russian; prices should be for the goods delivered in Russia. Secondly, conditions of payment must be such as will suit the Russian. Bankers and merchants all concurred in the view that credit was one of the chief points which would require special treatment by this country, in a trade campaign. German began her business invasion by sending travellers who were conversant, not only with the language of the country, but with the business methods. The latter are so different from those which obtain in this country, that a special study of these methods and conditions should be made by all who contemplate doing business with Russia. If



this is not done and the demands of the market are not met, then the huge trade and all that it means to us, will revert to Germany, or be captured by America. Germany, in opening up trade, allowed the Russian merchant long credit, even up to three years in some cases. The terms of sale were sometimes immediate delivery of the machine and payment was to be made when the Russian manufacturer was able. One of the Russian peculiarities of character is the dislike to pay even when perfectly able to meet liabilities. This is a fact which British merchants have not grasped hitherto, that the Russian merchant may put off paying, not because he is insolvent but because he "can't be bothered" at the time payment is due. He does not realise, as the British merchant does, that by putting off payment he will really have to pay more indirectly for his goods, and that his power for future buying on credit may be impaired. After some years of long credit, Germany reduced the terms of payment from three years to two-and-a-half or two years, then down to two years or one-and-a-half, and latterly the time was further reduced to from six months to one year. British merchants will, after the war, require to adopt some similar method, only they will have the benefit of the education which Germany has given, and will have to start more or less where Germany left off.

Whilst Britain will have to alter her methods, Russia will also require to put her house in order. For instance, the bankruptcy laws of Russia are exceedingly lax and leave many loopholes for fraudulent bankruptcy. Thus, if a firm becomes seriously involved financially, it is possible to sell the business nominally to a clerk in the business, and by making a slight alteration in the name of the firm, to carry on the business free from all its old liabilities. Thus, if a company trading as "Olive Branch Trading Company" became involved seriously, by effecting a more or less fictitious sale to one of the clerks in the office, or to some interested outsider such as a creditor, and calling the new business by the slightly changed name of "Olive Branch Trading and Manufacturing Company," the new company or firm would not be liable for any of the debts contracted by the old firm or company, but it is quite in order for the new company to receive all payments due to the old company. There is one feature which has many advantages for a firm in temporary difficulties, which is called, being "put under administration." This is somewhat similar to a firm being run by the creditors for their own benefit, and sometimes where the embarrassment has been of a temporary nature a good business has

been preserved for the behoof of the founder or his family. The difficulty is that one never knows, when a firm is under administration, whether or not it is safe to deal with it. It may mean that under good management the firm will pull through, on the other hand it may mean a largely increased debt.

The position of limited companies in Russia is very obscure. Every one in Britain is more or less familiar with the position of limited companies, and if not, it is an easy matter to consult a solicitor who will be able to state definitely the exact position; but in Russia the laws are so obscure and inadequate that it is difficult to know where one stands. All countries have certain restrictions governing the operation of foreign companies trading within its borders, but in Russia these restrictions are more numerous than in most others. In the event of a company being formed in Britain to manufacture in Russia, it must apply for Imperial confirmation before commencing its operations. In Mr. L. P. Rastorgoueff's book on the "Legal Position of English Companies in Russia," he says, "For the management of the business in Russia, the company must appoint a responsible agent, with full power of attorney. This agent is obliged to (a) represent the company in the Courts in case of an action against them: (b) to decide independently and immediately, in the name of the company all claims against them, whether on the part of the Russian Government or on that of a private person, including employees and workmen. This responsible agent is, therefore, a substitute in Russia for the board of directors, and the company does not require a separate board for its Russian business. The agent manages the business on behalf of the company and under instructions from the board of directors in England, of which he may be a member; but in Russia he is absolutely independent of the board, and his decisions are valid, even if made contrary to their instructions: that is to say, as regards the Russian Authorities he is the sole representative of the company." No registered office of the company is necessary in Russia, but the Government must be informed who is the representative and the place of his office. The same information must be given to the authorities of the locality in which the agent's office is situated. An advertisement to this effect must be published in the central and local official newspapers. The representative keeps all the books of the company connected with its operations in Russia, and various formalities in connection with these and the balance sheet, have to be observed. The representative is usually a Russian subject and not of the Jewish faith.

As an illustration of the difference between the British and the Russian mind regarding business, two cases may be cited, the facts being taken from Mr. Rastorgoueff's book which has been mentioned previously. The first is interesting, as showing the fondness of the Russian to appoint "Commissions" to consider and report on all and every subject, their faculty for discovering the weak point, combined with their conservatism which permits them to retain that which they themselves have condemned. As was stated earlier, company law is chaotic, and this is not to be wondered at when it is realised that the first law relating to the formation and management of public companies was promulgated in the year 1836 and remains almost unchanged up to the present.

It is confused, incomplete and quite inadequate to meet the requirements of the present day. The increase in the number of companies drew attention to the necessity of improvement in the laws relating to them, and it was decided in 1858 to appoint a Commission to draw up a new scheme. The Commission drew up a scheme, which was presented to the Council of State in 1867. It was not confirmed. From that time onwards the attempts of the Government to reform these laws have never ceased. Commission succeeded Commission, innumerable meetings were held, countless enquiries instituted, investigations were conducted, reports were drawn up and printed into volumes. The matter ended there. The final result of all this titanic labour extending over a period of more than forty years, was, in 1904 the enactment of a law dealing with the rules relating to, general meetings, constitution of boards, and audits.

When the railway between Moscow and Petrograd was begun, an Imperial Ukase was issued ordering that all the material which was to be used in the construction of the railway must be of Russian manufacture. An order was given for over 80,000 tons of rails to a company which was immediately formed to carry out this part of the work. The company, with an extraordinary lack of forethought, fixed upon Petrograd as the centre where their works were to be placed. Petrograd is hundreds of miles away from the districts where coal and iron are produced. For three years the Government subsidised the company with very considerable sums of money, but yet at the end of that time not a single ton of rails had been made, and finally the order was placed abroad for completion.

It is hoped that the preceding arguments and illustrations have made it clear, that, while there are difficulties in Russia to

be overcome, there is also a great reward awaiting those who, having entered the arena and overcome the initial difficulties, persevere to a successful finish. The one determining factor which this country lacks now and must endeavour to cultivate, is commercial organisation. British manufacturers are sometimes blamed for lack of enterprise and initiative. This is one of these assertions which seems to be true but which really is more false than true. After all, most men are in business to make money, and not to conduct a philanthropic society for supplying goods to foreigners under cost price. Enterprise and initiative may manifest themselves in many different ways. They may take the form of standardisation of manufacture and the installation of special machinery which enables one particular class of an article of standard design to be turned out at a minimum of cost. If the manufacturer of this standard article is asked to make something which departs from the standard in one or two small details, the whole system of manufacturing and costing is thrown into confusion; the result is this, that a large manufacturer, so long as he is able to keep his plant fully employed on standard work, does not care to alter his designs to suit what may be but a small trial order from abroad. The small manufacturer is not so fastidious. He cannot as a rule lay down expensive machinery specially adapted to turn out some one or two special articles at a minimum of cost. The reason for this is that, as a rule, he does not know when he starts out to manufacture, along what line his business will develop. Again, the large manufacturer has money to spend on travellers' salaries, newspaper advertising, and other selling plans; consequently his manufactures become spread over a wide area, and by their wide sales help still further to advertise his wares, so that if this manufacturer, say, of pressure gauges, which he manufactures in a standard design in polished brass cases, be asked to supply a similar gauge but in cast iron cases, by some particular foreign customer, who has seen samples of his gauges, perhaps in some boiler installation which has been fitted up by a British firm, or perhaps because of an advertisement in some trade paper, or through a call made by one of the manufacturers' travellers, the reply which is sent to this foreigner's enquiry is usually that the manufacturer has no facilities for turning out an article which is a departure from the standard design, at a price which would compete with a similar article manufactured by some other firm, who having discovered the demand for this class of gauge, has put down machinery to meet the demand. This is a perfectly correct

reply; new patterns would require to be made and might possibly never be used again. If piece work is the rule in the shop, new rates would have to be made out, and the probability is that the workmen who got the job to do would grumble, giving as a reason that they could make more money at the standard type, and this new department might even be the means of causing serious labour trouble in the works. The cost system would be upset and generally the trouble and inconvenience would be so great that unless the order was for a substantial number, and there was every possibility of a large and increasing trade eventually developing, the price quoted to the enquirer would be so high as to prevent the order being placed. The small manufacturer has few, if any, of these troubles. This is principally due to the fact that he is in close touch with all his workmen, and unfortunately, in many cases, has no elaborate system of keeping costs. He would be ready to do the work if he could get the enquiry, but unfortunately, his small production does not permit of a traveller's salary. He has to do what travelling is necessary, in and around his own district, when he can spare time from other important occupations. His advertising is limited to one or two papers, which have mostly an English reading public, and finally his wares are sold principally in the locality where his own personal connection commands sales, so that this form of advertising is also restricted. His large neighbour may send him the enquiry, but when his price is increased by the profit which his client and competitor adds on for the trouble and expense of securing the order, the matter is practically in the same position as in the previous case.

The question of whether it is better to have one large works employing say, 1,000 men or ten smaller works employing 100 each, is one which is outside the scope of this paper, but it may be confidently asserted that there are greater opportunities for individualism and originality in the system which allows a greater number of small works to make headway. One thing at least is certain, that nine men have a chance of proving that they can earn their own livelihood and develop their businesses instead of being dependant on the organisation ability and originality of the tenth man. What, however, is lacking is the absence of selling power and the ability to finance orders which are not to be paid for until some considerable time after the goods have been delivered. The weak point in the commercial organisation of this country is that there is no central selling agency which will have a sufficient momentum in itself to carry

on a large foreign trade, arrange for the buying of supplies, the advertising of the manufactured article, and finally the financing of the firms who are willing to manufacture for foreign markets but whose capital is limited. Such a scheme could easily be organised, and the benefits which it would confer upon the traders and manufacturers in this country would be inestimable. The scheme is not new, but in this country awaits the advent of some organising genius with a sufficient financial backing.

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### DISCUSSION.

The CHAIRMAN: We have listened to Mr. Anderson's lecture with very great pleasure and I should be glad if any members who would like to question him, would do so now.

Mr. JAMES KEITH: I am a new member of the Institute and here to-night at a meeting for the first time. I have listened to the paper read with great pleasure, although I do not claim much knowledge on the subject. The suggestions Mr. Anderson has thrown out have a great deal in them: at the present time, however, the problem of doing business with Russia lies principally in the money difficulty and the question of the exchange; until we have solved these, business will be almost impracticable. As to the future, it is of course futile to think of a solid country like Great Britain to compete with German bankers in the risk of capital outlay by long commercial credits or otherwise in Russia, until the commercial law at any rate of the country has been brought on to a basis sufficiently sound to warrant ordinary trade risks. Is the means of transit good beyond what has been named?

Mr. ANDERSON: In addition there is a very good train service through Scandinavia to the borders of Finland, and the service between Finland and Russia is also good, owing to there being no continuous line of railway through Scandinavia to Petrograd. I know of a case in which some very heavy machinery was taken from England to Vladivostok and transferred to Petrograd by rail in order to avoid this transport over the river at the Finland border.

With regard to the break between Karungi and Karunki, when I went out in February, they had built a small railway from Tornea up to Karunki. The distance was something like 20 kilometres, and they laid down a small branch railway; run-

ning along this line a little train composed of three coaches, which was used until about April; on coming home, the Finland express ran through Tornea up to Karungi.

Mr. TIMPSON: I should like to ask Mr. Anderson whether he had any opportunity, whilst in Russia, of judging if any preference was given to supplies from countries using the metric system of weights and measures, and if this system was generally used in engineering practice. There is also the question of credits which seems to have been given on a generous scale by some of our competitors, and as this accomodation may count, is there any good means of finding the status of Russian firms, this of course requiring discretion.

Mr. ANDERSON: That is rather a difficult point. As far as I could gather among my friends there, in marine engineering, and dealing first of all with the manufacturing side, it seems to me that the shipyards have been organised by experts from this country. One of my friends told me that when they went there first, they had a perfectly free hand, but later on, Russian technical experts took up the management. The Russian workman is becoming a very good mechanic, and I am told that they take an intelligent interest in their work and are very careful, carrying out their instructions to the letter. A new generation of engineers is also springing up; instead of the men who had only technical knowledge, you have men who have received the technical training and have been through the workshops as well, and through years of training also, the Russian workman is becoming much more intelligent and able to do more intricate work. Some of the work I saw turned out was second to none. I saw a bridge which might have been built by any famous bridge builder in this country or America, every detail of the workmanship seemed to be all it should be, but there seems to be a lack of driving power behind the average Russian. He will get an idea, proceed to carry it out feverishly, rush about, and then get tired of it in a couple of days. Import duty, too, is very heavy on almost all finished machinery, but much less for half-finished parts. Take the case of wire ropes on which the duty is almost prohibitive; but if you import the wire for the making of the ropes, you will get it through the Customs at a very much reduced rate. The duty on electrical machines is also very heavy. Take the case of an electrically driven turning lathe; this would be classed as an electric machine on which there is a very high tariff; but detach the motor from the machine and send the two through separately,

the duty is very much less. This would apply to all machines electrically driven; wherever possible, the motor should be detached from the machine, and shipped separately.

The CHAIRMAN: I have no doubt that many points in the paper appeal to many of you. I should be glad if some other members would join in the discussion.

Mr. D. SMART: As regards marine engineering, I have seen work done in Russia, which is nearly as good as anything I have seen here. The workmen I have seen have been for years working under the supervision of British foremen, but the machinery they turned out was good, and they had made all the parts themselves. As regards marine engineering, there is one large company located on the borders of the Black Sea, the majority of their engineers, up to about ten years ago were British, but no British are there now. All ships are run by Russians, the dry docks, repairing works, in fact everything, is exclusively Russian. A large amount of work is done in Moscow, and there is one place, I cannot at present name it, where 2,000 workmen are employed, all Russians, and 20 or 30 of the staff are British. Everything required can be produced in the country, as they have their own natural resources, and they are going ahead improving rapidly.

Mr. WM. MACLAREN: This has been a very interesting paper, and has been unique in its way, but, without intending any disparagement, perhaps I may be permitted to remark that though the heading of the paper is "Engineering Prospects in Russia," it does not deal very largely with this. There is one thing I should like to touch on, and that is the British Consular Service. We cannot pride ourselves on this branch, and many of us know to our cost the sort of British Consul we meet abroad. A Consul, to be any good, must be acquainted with the commercial life of the country he is sent to; but this is rarely the case with the British Consul anywhere. We appear to be unable to pay an adequate salary to a Consul in the majority of cases, and the consequence is that we get an inferior class of man, so much so, that when invited into good society he is quite out of his latitude, with the result that the nation he is supposed to represent suffers disparagement. We ought to have, in every country, a representative of Britain worthy to uphold the name, and fit to move in any society in the particular country he is placed in. I think this is one matter in which we are very much behind. Let us turn to consider for a moment what Germany has done in comparison, and such a



thought has been before me for years, they have pursued an exactly contrary course, and are very particular about their Consuls, and do not grudge them an adequate salary.

Coming back to my own experience where I was called upon to deal with foreign work. I had the handsome sum of 14/- a week extra added to my salary to cope with the outlay which was called for under the circumstances. Compare that with the German who is sent here as a mechanic, his payment is 25/- a day; the comparison is beyond reason. It seems to me that the Germans make it their business to do what we really ought to do. For instance, in the case of manufacturing some article of a particular colour, the German will make it any colour you like, if he can manage it. Why cannot we do this also? We have been pushed on by American ideas, so that we can standardise and manufacture cheaply. In Britain it seems to be a complaint if a buyer wants anything different to our usual make. Let us get the orders and see to the execution of them according to the requirement of the customer, and pay greater attention to details, I mean personal attention on the part of principals. Germany for 10 years before the war, has been able to meet us in competition due to their systematic methods, and frequently in 25 per cent less time than it took a British manufacturer to manufacture the goods. I am aware of a case where the Germans were able to offer to supply in six weeks where a British manufacturer wanted six months, the shorter period was one of the conditions, and the British firms lost the work, the determining factor was not cheapness but time. On one occasion when in Stettin I had about five months' experience witnessing a great competition with the subsidised China Mail Boats built in the Vulcan Yard and in Clyde Yards; still I hear that the ships can be built cheaper on the Clyde; but if we do not alter some of our methods, we are bound to lose in the competition for the trade and commerce of the world.

Mr. SMART: I may say that Russia holds the field in weighing machines of small size. There is a machine which I saw in one of the yards there, which eclipsed anything of the kind I had met with before, from the point of view of efficiency.

The CHAIRMAN: I think that the paper Mr. Anderson has given us is one which, if not just now, at any rate in the near future, should be taken up and discussed in the Chambers of Commerce of our country. Mr. Anderson has given us a most interesting account of Russian business customs and methods, and his impressions in regard to future possibilities for the

engineering trade of this country in order to cope with and supply the necessities of Russia. The great loss of life which this war is causing among the class of men who would otherwise have been employed in the factories, will materially affect the industries of Russia, and a large field will be opened to the engineers of other countries.

Mr. Anderson reminds us that our business methods in this country will require re-organisation if the British manufacturer is to get a share of the trade in the future, not in Russia only, but in other countries also. The present crisis has disclosed how dependent we have been upon Germany for much in the engineering world which should be manufactured in this country, and I think the matter is one of grave importance, and what Mr. Anderson has told us is quite true.

His Majesty King George was evidently alive to the shortcomings of the old business methods of our country when he said "Wake up, England." We have seen that Russia presents a wide scope for business in the various branches of engineering, and it is to be hoped that these opportunities will not be overlooked by the enterprising manufacturers of Great Britain.

Mr. JOHN MACLAREN: I have been very much interested in the paper read by Mr. Anderson, and agree that we must be prepared to advance with the times. About two years ago, I travelled through Russia, passing along the Siberian Railway. I began to realise the size of Russia when I found I had travelled thousands of miles without getting out of Russian territory. I stayed there long enough to form the opinion that Russia is capable of very great developments. The country is very rich in minerals, but the mines have not yet been properly worked, and some have not been worked at all. It seems to me that Russia stands somewhat in her own way owing to the terrible restrictions on imports, and the various formalities connected with passports, etc. A Britisher resents all that. It is true that the German traders have been established there for years past. I hope that after the war, Russia will see the error of her ways. I am much interested in some of the preceding remarks, and hope that we, as Britishers, will make some new laws to develop foreign markets. When peace comes we ought to be able to trade together. Russia is going ahead and beginning to supply most of her own wants; but she is an agricultural country in the first place, and it will be a long time before she can supply all her wants, especially in machinery. I have

formed the opinion, although I may be wrong, that the Russian workman is a little clumsy—I have seen them lay rivets with hand hammers. In course of time they will get over that sort of thing.

I must say that Mr. Anderson has taken up a field which ought to appeal to the British public, and on this point my attention has been called to an article in the *Marine Engineer*. It is not only the business man who ought to handle this question. The Government, or some very high officials ought to take it up, give the British trader assistance in developing foreign markets, and see that he is covered from loss. The subject of foreign trade is a most important one; we are much obliged to Mr. Anderson for bringing it up, and I have great pleasure in proposing a hearty vote of thanks.

Mr. E. SHACKLETON: I am sure that we are all much indebted to Mr. Anderson for his very interesting paper. German influence in Russia in commerce has long been in the ascendant, and in an indirect way the prospect of termination of the favourable commercial treaty between Germany and Russia in 1914, a treaty which was entirely to the advantage of Germany, and one which Russia had indicated would not be renewed was another factor of dispute between the two nations when war broke out in 1914, it having been stated that Germany demanded renewal of the old treaty with threats. German commercial men boast that when the present war ceases they will again corner most of the Russian trade. I am aware of one British firm of engineers who lost some £20,000 in bad debts in a desire to extend their Russian business. It is to be hoped that we shall be able to secure a better share of the trade in the near future by new methods, for we can rest assured the German concerns will fight to maintain their hold on the Russian business. I have pleasure in seconding the vote of thanks.

Mr. ANDERSON: It has given me very great pleasure to come to London and meet my old friends, and I thank you all for the kind reception you have accorded to me.

The following is the article which appeared in the *Marine Engineer and Naval Architect* for October, referred to in the course of the discussion:—

#### THE INSTITUTE OF INDUSTRY.

This Institute has been formed for the purpose of formulating plans to establish markets and develop national and imperial industries in all parts of the world. That there is need for such an Institute, or at least some central authority, has been manifest for several years to keep the manufacturer in close touch with the markets and the requirements of customers or likely customers.

A representative resident near or in close touch with a market can note the changes which take place from time to time, and advise these in order to have articles manufactured suitable to meet these requirements. Instances have come under observation where a manufacturer has lost a connection with a good set of customers because he has not accommodated his output to suit the market requirements, either from want of knowledge, or from a desire to uphold his own standard rather than yield to a demand he has no sympathy with, added to which his machinery may be inadequate to meet the new conditions. The natural adviser of the manufacturer at a foreign market one would consider to be the Government representative, or the Consul representing the nation; hitherto he has been of very little service as an adviser in connection with trade and commerce, with a few exceptions, and these have chiefly been instrumental in developing the local trade in the district over which they presided as representatives. The Institute is the central organisation for the purpose of developing national and imperial industries by establishing unity of purpose in industrial, scientific and commercial activity in the United Kingdom, the Dominions, Colonies, and Possessions. The vice-presidents and directors are men who are well known in the world of science, trade and commerce.

In the *Canadian Engineer* of October 28th, there is an editorial which shows that action is also being taken in Canada as to improving the conditions of industrial work. The article is as follows:—

## "A COMMISSION ON NATIONAL RESOURCES."

The Dominion Government has recently appointed a new Commission, assigning to it a huge task. It is to be a sort of general purpose Commission to take stock of Canada's national resources, to investigate a large number of problems, and to report upon their economical and expeditious solution. Among the problems consigned to it are those of increased production, co-operative systems, unemployment, and transportation by rail and water. Their work will consequently be of no small interest to the engineer. In fact, many a Canadian engineer has devoted much time and study to these very problems, and has attained a worthy reputation for himself and his colleagues as to the advance guard of scientific economy and national development. The Commission is made up of ten prominent men under the chairmanship of Senator Loughead. Men have been chosen that will undertake the task with vim and will devote a great deal of energy to its fulfilment. It is really unfair to these men that they should start their work with a handicap. Having to do with a considerable amount of engineering economics, how much more efficiently might they be expected to persevere in their researches if assisted by the skilful knowledge and training of a capable engineer as one of their number.

The usefulness of an engineer on such a commission was probably never considered. At any rate, it is difficult to imagine an advertent Government disregarding his qualifications in a case like this, if it is ordained that the Commission shall really be a useful one. It is but another case of the engineer missing by an inch or a mile the recognition which he deserves and which is badly needed for the exercise of that influence so necessary for proper control in the administration of engineering affairs.

The following letter appeared in the *Glasgow Herald*, and is here reprinted as it bears directly on the subject matter of the paper:—

## \*OUR TRADE WITH RUSSIA.

September 28th, 1915.

Sir,—I have been over 20 years resident in Russia, and during those years have seen the tremendous advance

\* By permission of the Editor of the "Glasgow Herald," in which it appeared on October 12th.

which Germany has made in her trade with that country, with the result that she has to a large extent ousted the British trader in a great many of the imports, and for what reason? Simply because the latter will not adapt himself to the requirements of the Russian merchant. Several cases have been pointed out to the writer in which very large orders were lost for various articles, such as musical instruments, cutlery, etc., which were wanted by a friend of his who deals largely in these articles, and who wished to place his orders with British firms, but had to go elsewhere—Germany and America—owing to the British firms refusing to undertake a small alteration which was wanted in the things asked for so as to suit the Russian demands, their excuse being that they could not depart from their own style of manufacture. This was also the case with a motor car agent in Russia who formerly sold British machines. These were found to be too lightly made for the bad Russian roads, and on him asking the manufacturers to make the cars stronger so as to suit the heavy roads he was told that they could not depart from their special design, with the result that he had to go elsewhere, and most of the machines now being imported are from Germany, France, and America, where the firms are open to meet the demands and requirements of the Russian buyer.

A great many more cases could be given of shortsightedness on the part of the British manufacturers to adapt themselves to the wants of the Russian markets. This is one of the chief reasons why they have, to a great extent, lost their hold on the Russian trade.

The chief aim of the German merchant is to get orders, and he accepts and is agreeable to supply almost anything in his line of business, notwithstanding that the article wanted has to undergo several alterations outside of his own special design or manufacture so as to suit the buyer.

Is it then to be wondered at that the British manufacturer, through his conservatism and stubbornness, loses many an order, and later on wonders at the dropping off in his trade, and wonders also where his former clients have gone to?

Not only this, but the German Government gives every assistance to the German trader, and also bounties, so that trade can be done, and it is astonishing to see the number

of German travellers of every description which come to Russia. These are assisted in every way possible by their Consuls in the various towns, who are willing to undertake almost all the requirements of the Russian in any and every branch of the trade.

It is a well-known fact that before the war our country was full of German business Consuls, specially placed for the sole purpose of spying on our large industries, and finding out the best ways and means of securing orders for German concerns. Many large orders have been secured by them in this way. These, if we had been energetic enough, should have remained with us. I have no doubt that in many cases they have been employed by us in our offices and factories as volunteers, where they have learned, and afterwards returned to Germany and commenced, in various ways, serious competition against us.

The writer also knows that the Americans, through their Consuls and otherwise, are now doing all they possibly can to increase their commercial connections with Russia, and that every assistance is being given by their Consuls to Russian buyers to find out good American connections for them, and to find out at the same time the chief articles of which Russia is in need.

I am sorry to say that this is not the case with us, as our Consuls are a long way behind the Germans and Americans in this respect. For this and other reasons our Consular system requires a radical change.

Our Consuls abroad are too few in number, and in a great many cases the vice-Consuls are not British subjects. At least, this was the case before the war. Besides, most of them have very little business capacity, and have not the time to take any interest in the furtherance of trade with this country, while they are also full of red tape.

It is high time that steps were taken to remedy this, and that in all big towns, or towns of commercial importance, an energetic and business representative should be placed to look after the interests of British merchants solely, and the increase of trade with Great Britain which the Huns have at present lost through the war, and which the writer hopes they will not get back again. If the British merchant and manufacturer does not now waken out of his supposed self-secure position and arouse himself he will see

to his detriment that the Hun will once more get in the thin end of the wedge. There is not the slightest doubt but that at the present moment Germany is preparing and manufacturing large quantities of goods to dump into our own and other countries as soon as the war is over.

A great opportunity is now open to the British manufacturer to secure most of the trade with Russia, as the Russians themselves will be only too willing to increase their business relationship with Great Britain; but the latter must find means and ways to supply the article which the Russians want, and not think that if the Russian merchant does not accept his special manufacture that he cannot get it elsewhere, as has been the case formerly. There is no doubt that the German trader will be crippled to a great extent in reopening his business connections, especially with Russia, as it is hardly possible to conceive that the German banking concerns will be able as hitherto to give the large advances and credits to their clients which enabled them in turn to give long credits to their customers. It would, I think, also be a great advantage to British traders if our banks were to assist them in securing business which is very often lost through their non-confidence in giving credit. I also noticed a great falling off of the British shipping trade with Russia. When I went to Russia first, at one of the chief ports, in the first years of my stay, nearly all the steamers entering the ports were British owned, while before the war it was about one to five, the latter being chiefly German and Danish owned vessels. This has been brought about principally by the increases of trade with Germany, and, secondly, by the subsidies given to owners by their respective Governments, which have enabled them to offer a reduction in freight on nearly all through traffic from America and other ports. To show this—the greater part of the cotton imports from America and Egypt are carried in foreign bottoms, besides other cargo, and to-day regular lines are being run. If this can be done by other countries, why cannot we do the same so that we might be in a position to compete?

Of course we know that the British Government does subsidise some of the bigger shipping companies, but this could be extended greatly so as to facilitate business all over the world. It is very likely that Russia will increase harbour dues on all German shipping, besides putting



higher duties on all German imports after the war is over, and it is for us to see that we get back the greater part of the trade which we have lost during the past 20 years.

A large business is being done at the moment between this country and Archangel, but that port is quite inadequate to cope with the imports and exports, and great delays are being experienced by all in the trade. These stop to a large extent any proper development, and it is thus of vital importance that a passage should be opened up through the Dardanelles to the Black Sea, where many good Russian ports are waiting anxiously to commence business with us.

The Germans, through their business policy, have found out the enormous wealth lying in Russia waiting on the first comer to develop it, and it is very peculiar that most of us know very little, if anything at all, about this, mostly through our having gone to sleep in our self-supposed security in business and otherwise, and it is high time for us to see that we also have a share in the good things of this world, especially with our Allies, the Russians.

C. J. R. S.

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REPLY BY MR. ANDERSON.

14th October, 1915.

I have read with considerable interest the letter which appeared in your issue of 12th inst., over the signature C.J.R.S., and I think it only fair to place before your readers some extenuating circumstances for what is admittedly the backward condition of British trade with Russia.

Germany's predominance was largely the result of the Commercial Treaty of 1904, which was very favourable to German interests. This, with the assistance of a Conventional Tariff, permitted German goods to enter Russia under a reduced custom's duty, and it is admitted in Russia that an alteration of their Commercial Law which would accord greater security for industrial enterprise, would tend to foster the introduction of British capital, and the extension of British trade with Russia.

The old cry is raised that British manufacturers refuse to make small alterations to suit local conditions, and claiming that in the case of motor cars America was willing to alter her practice to suit Russian requirements, and by so doing reaped a large reward.

One would like to know about this before offering an opinion. First, what companies in Great Britain were asked to alter their designs? Similarly the names of the American firms.

While it has no direct bearing on Russian trade it may be pertinent to mention that manufacturers in this country are constantly being hounded by one section to standardise and adopt the American principal of never departing from that standard under any circumstances, and secondly, to follow America's lead and adapt designs to suit local conditions. These two diametrically opposed pieces of advice make it exceedingly difficult for the plain man to know what he should do.

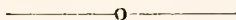
One would imagine from C.J.R.S. that it was only a German merchant whose chief aim "is to get orders." Any merchant whose chief aim is other than the obtaining of orders will very soon cease to be a merchant.

Towards the end of his letter your correspondent gets to the crux of the matter, that one of the disadvantages which this country has laboured under is the lack of the service which the German and American consul system placed at the service of their countrymen; but the principal factor entering into the problem of capturing the Russian trade is contained in the paragraph which begins:—

"A great opportunity is now open to the British manufacturer to secure most of the trade with Russia . . . . . the German trader will be crippled to a great extent, especially with Russia, as it is hardly possibly to conceive that the German banking concerns will be able as hitherto to give the large advances and credits to their clients which enabled them in turn to give long credits to their customers."

In dealing with Russia, especially, this question of long credits will continually crop up, and either Russia must change her business system, or Great Britain will require to modify hers.

Finally, at the risk of being called a conservative Britisher, it seems to me that it is the Russian credit system which will have to be altered, unless of course, the old proverb of small profits and quick returns is to be altered to one of large profits and slow returns, which is almost inconceivable to one who follows the trend of modern business.



The following official paper has been issued by the President of the Board of Education with the object of regulating and assisting the industrial life of the country. The appropriateness of such a scheme is manifest from the discussion which took place on the paper by Mr. Anderson:—

#### SCHEME FOR THE ORGANISATION AND DEVELOPMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH.

1. There is a strong consensus of opinion among persons engaged both in science and in industry that a special need exists at the present time for new machinery and for additional State assistance in order to promote and organise scientific research with a view especially to its application to trade and industry. It is well-known that many of our industries have since the outbreak of war suffered through our inability to produce at home certain articles and materials required in trade processes, the manufacture of which has become localised abroad, and particularly in Germany, because science has there been more thoroughly and effectively applied to the solution of scientific problems bearing on trade and industry and to the elaboration of economical and improved processes of manufacture. It is impossible to contemplate without considerable apprehension the situation which will arise at the end of the war unless our scientific resources have previously been enlarged and organised to meet it. It appears incontrovertible that if we are to advance or even maintain our industrial position we must as a nation aim at such a development of scientific and industrial research as will place us in a position to expand and strengthen our industries and to compete successfully with the most highly organised of our rivals. The difficulties of advancing on these lines during the war are obvious, and are not under-estimated, but we cannot hope to improvise an effective system at the

moment when hostilities cease, and unless during the present period we are able to make a substantial advance we shall certainly be unable to do what is necessary in the equally difficult period of reconstruction which will follow the war.

2. The present scheme is designed to establish a permanent organisation for the promotion of industrial and scientific research.

It is in no way intended that it should replace or interfere with the arrangements which have been or may be made by the War Office or Admiralty or Ministry of Munitions to obtain scientific advice and investigation in connection with the provision of munitions of war. It is, of course, obvious that at the present moment it is essential that the War Office, the Admiralty, and the Ministry of Munitions should continue to make their own direct arrangements with scientific men and institutions with the least possible delay.

3. It is clearly desirable that the scheme should operate over the Kingdom as a whole with as little regard as possible to the Tweed and the Irish Channel. The research done should be for the Kingdom as a whole, and there should be complete liberty to utilise the most effective institutions and investigators available, irrespective of their location in England, Wales, Scotland or Ireland. There must therefore be a single fund for the assistance of research, under a single responsible Body.

4. The scheme accordingly provides for the establishment of:—

- (a) A Committee of the Privy Council responsible for the expenditure of any new moneys provided by Parliament for scientific and industrial research;
- (b) A small Advisory Council responsible to the Committee of Council and composed mainly of eminent scientific men and men actually engaged in industries dependent upon scientific research.

5. The Committee of Council will consist of the Lord President, the Chancellor of the Exchequer, the Secretary for Scotland, the President of the Board of Trade, the President of the Board of Education (who will be Vice-President of the Committee), the Chief Secretary for Ire-

land, together with such other Ministers and individual Members of the Council as it may be thought desirable to add.

The first non-official Members of the Committee will be:—

The Right Hon. Viscount Haldane of Cloan, O.M., K.T.  
F.R.S.

The Right Hon. Arthur H. D. Acland, and

The Right Hon. Joseph A. Pease, M.P.

The President of the Board of Education will answer in the House of Commons for the sub-head on the Vote, which will be accounted for by the Treasury under Class IV., Vote 7, "Scientific Investigations, &c."

It is obvious that the organisation and development of research is a matter which greatly affects the public educational systems of the Kingdom. A great part of all research will necessarily be done in Universities and Colleges which are already aided by the State, and the supply and training of a sufficient number of young persons competent to undertake research can only be secured through the public system of education.

6. The primary functions of the Advisory Council will be to advise the Committee of Council on—

- (i) proposals for instituting specific researches;
- (ii) proposals for establishing or developing special institutions or departments of existing institutions for the scientific study of problems affecting particular industries and trades;
- (iii) the establishment and award of Research Studentships and Fellowships.

The Advisory Council will also be available, if requested, to advise the several Education Departments as to the steps which should be taken for increasing the supply of workers competent to undertake scientific research.

Arrangements will be made by which the Council will keep in close touch with all Government Departments concerned with or interested in scientific research and by which the Council will have regard to the research work which is being done or may be done by the National Physical Laboratory.

7. It is essential that the Advisory Council should act in intimate co-operation with the Royal Society and the existing scientific or professional Associations, Societies and Institutes, as well as with the Universities, Technical Institutions and other Institutions in which research is or can be efficiently conducted.

It is proposed to ask the Royal Society and the principal scientific and professional associations, societies and institutes to undertake the function of initiating proposals for the consideration of the Advisory Council, and a regular procedure for inviting and collecting proposals will be established. The Advisory Council will also be at liberty to receive proposals from individuals and themselves to initiate proposals.

All possible means will be used to enlist the interest and secure the co-operation of persons directly engaged in trade and industry.

8. It is contemplated that the Advisory Council will work largely through Sub-Committees reinforced by suitable experts in the particular branch of science or industry concerned. On these Sub-Committees it would be desirable as far as possible to enlist the services of persons actually engaged in scientific trades and manufactures dependent on science.

9. As regards the use or profits of discoveries, the general principle on which grants will be made by the Committee of Council is that discoveries made by institutions, associations, bodies, or individuals in the course of researches aided by public money shall be made available under proper conditions for the public advantage.

10. It is important in order to secure effective working that the Advisory Council should be a small Body, but it is recognised that even if full use is made by the Council of its power to work through reinforced Sub-Committees, its membership may be found inadequate to do justice to all the branches of industry in which proposals for research may be made or to the requests of other Government Departments for assistance. It is therefore probable that it will be found necessary to strengthen the Council by appointing additional Members.

The first Members of the Council will be:—

\*The Right Hon. Lord Rayleigh, O.M., LL.D., Mr. G. T. Beilby, LL.D., Mr. W. Duddell, Prof. B. Hopkinson, Prof. J. A. M'Clelland, Prof. R. Meldola, Mr. R. Threlfall; with Sir William S. M'Cormick, LL.D., as *administrative Chairman*.

11. The Advisory Council will proceed to frame a scheme or programme for their own guidance in recommending proposals for research and for the guidance of the Committee of Council in allocating such State funds as may be available. This scheme will naturally be designed to operate over some years in advance, and in framing it the Council must necessarily have due regard to the relative urgency of the problems requiring solution, the supply of trained researchers available for particular pieces of research, and the material facilities in the form of laboratories and equipment which are available or can be provided for specific researches. Such a scheme will naturally be elastic and will require modification from year to year; but it is obviously undesirable that the Council should live "from hand to mouth" or work on the principle of "first come first served," and the recommendations (which for the purpose of estimating they will have to make annually to the Committee of Council) should represent progressive instalments of a considered programme and policy. A large part of their work will be that of examining, selecting, combining, and co-ordinating rather than that of originating. One of their chief functions will be the prevention of overlapping between institutions or individuals engaged in research. They will, on the other hand, be at liberty to initiate proposals and to institute inquiries preliminary to preparing or eliciting proposals for useful research, and in this way they may help to concentrate on problems requiring solution the interest of all persons concerned in the development of all branches of scientific industry.

12. An Annual Report, embodying the Report of the Advisory Council, will be made to His Majesty by the Committee of Council and laid before Parliament.

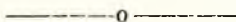
13. Office accommodation and staff will be provided for the Committee and Council by the Board of Education.

ARTHUR HENDERSON.

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\* Fellows of the Royal Society.

In accordance with a proposed appointment to meet in conference with Sir. Wm. M'Cormick on October 18th, an arrangement was made to meet Sir Arch. Denny, President, to discuss, prior to the Conference, the various details of Marine Engineering which should fittingly come within the scope of the proposed scheme. After the meeting, the President, accompanied by Messrs. J. T. Milton, F. M. Timpson, and the Hon. Secretary, attended the Conference, presided over by Sir Wm. M'Cormick, when a number of suggestions were made and various points noted for the consideration of the Advisory Council in order to have these tabulated for the Committees to be appointed under the sub-headings found necessary to carry the scheme effectually into useful operation. It was urged that the practical side of industrial works should be efficiently represented on the Advisory Council.



The following is a report representing the view of the Advisory Council on the subject of Marine Engineering, received from Sir Wm. M'Cormick:—

1. Questions arising regarding steel, more especially high tension steel, rolled material for constructional purposes, special alloy steels for shafts, etc., and special steels for important castings.

2. The improvement of cast iron. It is now possible to obtain castings of much greater strength than formerly, and still retain good resistance to shock. Considerable attention to this has been given on the Continent, especially in regard to the parts of internal combustion engines subject to severe stresses and to intense heat.

3. The metallurgy of non-ferrous metals, as regards their non-corrodibility and also as regards strength. At the Dusseldorf Exhibition, Krupp exhibited specimens of what was named "Steel Bronze," both forged and cast, possessing extremely high strength combined with high ductility.

4. Questions relating to the suitability of alloys for turbine blades for use with highly superheated steam.

5. The use of high superheat for steam engines.

6. Oils suitable for lubrication with highly superheated steam and with the high temperatures obtained in internal combustion engines.



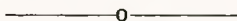
7. Questions relating to danger of heatings and explosions in air compressing plant, due to the oil employed for lubrication. These questions were accentuated by the accident on the *Succia*, and by the explosion at Bray, both with Diesel engines.

8. The use of liquid fuel especially of that with low flash point. The questions of the safe carrying and efficient combustion without damaging boilers are by no means finally solved.

9. Many interesting and debatable matters still await solution regarding the various methods of using fuel in internal combustion engines of the various types, such as Bolinder, semi-Diesel, Diesel of 2-stroke and of 4-stroke cycle, etc.

10. Many questions are raised in regard to refrigeration, most of which affect marine engineers who are responsible for the safe carriage of exceedingly valuable cargoes of refrigerated food stuffs. These questions are very varied, amongst others the following occur:—

- (a) Best method of producing and distributing cold.
- (b) Best method of preserving low temperatures throughout large spaces, and of ensuring uniformity of temperature both throughout the spaces and for long periods.
- (c) Efficiency of various insulating substances.
- (d) Proper temperatures and treatment required for the best preservation of various food commodities.
- (e) Many questions arise regarding the handling and transport of refrigerated products, between ships and stores, and also regarding the distribution to the final destination.



From the *Glasgow Herald* of November 23rd:—

A special Committee of the Engineers' Club, Manchester, have submitted a report and recommendations for organising the British engineering industry. The Committee are convinced that the British engineering industry must organise without delay to take advantage of present opportunities and to meet the conditions which will follow

the termination of the war, when our opponents, whose export trade has for the moment practically disappeared, will renew with increased strenuousness their methods of conducting a trade war against British industries.

The present is, in the opinion of the Committee, an opportune time for the engineering industry of this country to reorganise. The development of our engineering export trade has been highly unsatisfactory for some years, while Germany's rate of progress has been phenomenal. Germany's success has been due to education, co-operation, and organisation in manufacturing and selling, backed up by adequate financial support. In Britain, on the other hand education has been unsystematic, organisation weak, and co-operation between competing firms almost non-existent. Every British engineer must realise that his British competitor in some markets must be his friend and ally in others. They do not advocate trusts or combines, but they feel the urgent need for some voluntary organisation of the whole industry, based upon a recognition of the interests common to competing firms, and common also to employer and employed; and they believe that by voluntary organisation and co-operation a great deal can be done to improve manufacturing processes, to develop foreign trade, and to secure for employees better conditions of work and a larger share of the fruits of their labours.

They advocate the formation of an association on a non-trading and non-interference-with-prices basis. This association should comprise British manufacturing concerns in all branches of engineering, aim at the inclusion of every such concern, have a constitution giving it a legal status framed on broad principles, and an efficient and energetic management. It would speak with a powerful collective voice in matters with which Parliament was concerned, assist the Government in questions connected with industry and commerce, and be entitled to representation on the governing bodies of universities and technical colleges. It would not trade in any way whatever. It would assist members equally and without distinction in the obtaining of business, and would act in the interests of the industry as a whole.

Its work, should consist of general purposes, intelligence, production, inventions and patents, publicity, finance, education and research, Parliamentary Special

Committees might also be appointed from time to time to deal with temporary or special matters. The general purposes should be to bring pressure to bear upon railway, canal, and shipping companies for the improvement of conditions and reduction of freights; and to appoint arbitrators, or otherwise settle disputes arising between members. The Committee also explain at length what they would understand by the other "purposes" of the proposed association, and conclude by stating that they have endeavoured to outline what they believe to be the best way of advancing the interests of the British engineering industry. The multiplication of organisations is, they add, undesirable, and if an existing association would modify its constitution and extend its operations so as to give effect to their suggestions it would be better than to establish a new association. The whole-hearted support of the industry and adequate financial backing would ensure the success of the proposed organisation. The objects for which the Committee had laboured would be secured if every British engineer approached the matter in a spirit of true patriotism. The Committee therefore recommended an association on the lines indicated to the serious consideration of the Club.

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#### NATIONAL INDUSTRIES.

In connection with this subject, which undoubtedly calls for careful study with a view to a systematic improvement, the address delivered by Dr. H. D. Hele-Shaw, President of the Section, to the Engineering Section of the British Association, at Manchester is interesting and suggestive.

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The following editorial appeared in the *Practical Engineer* of December 2nd. It is reprinted by permission, and Mr. Anderson was desired to give his comments upon it:—

#### ENGINEERS AND THE RUSSIAN MARKET.

War has already changed many of our ideas, but the change it will surely effect in our ideas of commercial principles has hardly yet begun to work. Many are now turning their thoughts to the development of foreign trade

after the war, and instead of following a beaten track they are confronted with the need for making plans which cannot be put into operation for an indefinite time. This period of contemplation has been productive of a great deal of writing and speaking of very poor quality. Mr. James Anderson's paper, read at the Institute of Marine Engineers and very fully summarised in this issue is useful because it forms a careful collection of many wrong but widely current opinions on the subject. It is bound to attract attention in Russia, if only from the Engineering Press there, and as it will probably first become known to engineers in Russia through our columns, it would be well to send a little genial criticism with it. The British methods of pursuing foreign trade are shaped by political, economic, and traditional influences which are not easy to define. They are the result of a long historical process, modified by the changed, and always changing, industrial methods. The German commercial method is on quite a different footing. It is a manufactured system less than forty years old—a deliberate plan conceived by a ruling class which set itself to create a new nation—or a new national method (which we understand to be the nearest correct translation of German "Kultur"). Our Russian friends must not judge British commercial methods by the description of them given by Mr. Anderson, or any other writer. These methods must be judged by history for the most part and, of course, to some extent by current ideas as to the future. Mr. Anderson has gathered up the most superficial of current ideas and put them into the form of a policy without subjecting them to the independent criticism of his own mind and the facts of his own experience. The whole drift of his argument is that Britons should in future imitate German methods. He has not, evidently, reflected on the facts. It is these German methods that has made Germany hated and despised in Russia: because they have not only been methods of fraud and oppression on individual Russians, but have extended their influence to the attempted corruption of Russian public life and an attempt to make Russia into a political, as well as a commercial, bond-slave to Germany. It will not do for Mr. Anderson to say that he would not imitate the vices of the German method. Germany, more so than any other nation, has a deliberate method—a whole consistent policy in commercial affairs and every detail is made to conform to the main end, which

is to oppress and enslave those who do business with her. The British method, which Mr. Anderson unfavourably contrasts with the German in detail and does not understand in principle, has not this object in view. British commercial methods are open to criticism, perhaps very severe criticism, but they are not inspired and controlled by the Government with the deliberate purpose of taking away the political and economic freedom of the peoples we deal with. We do not, of course, ascribe to those who so lavishly praise German methods the desire to imitate German vices: but we do accuse them of talking about a matter which they have not fully studied, and more especially of depreciating their own countrymen and exalting Germans without carefully considering the points of difference. If Mr. Anderson's paper were widely accepted as correct in Russia, it would do infinite harm; because, the most efficient way to create Russian mistrust would be to announce that British producers and merchants are going to adopt German methods. We, therefore, ask our Russian readers and friends to accept Mr. Anderson's paper as an epitome of a superficial state of opinion that very largely prevails in this country—not amongst engineers or general traders, or amongst careful thinkers, but amongst newspapers and sensational book producers. In the end of the controversy the ideas in the paper will not affect British policy in the least. There will be considerable changes and improvements in British methods, but in a direction diverging still more widely from the German methods. Having stated the broad principle, let us examine some of the details by way of illustration. The German method in Russia began, as Mr. Anderson tells us, with three years' credit to Russians and a playing down to Russian faults and prejudices. Credit was gradually reduced when trade was secured, but enough debt was left to tie the hands of the Russian purchaser. This brilliant "German method" is merely the world-old artifice of the lowest class of trader and moneylender, who opens business as a suppliant and then continues it as a tyrant. The faults which Mr. Anderson finds with Russians — "the Russian peculiarities of character" as he terms them—have, no doubt, some foundation in fact, for Mr. Anderson has experience in Russia, and would not say what is untrue. The true interpretation of the "peculiarities" is, probably, that they are confined to certain classes of Russian traders and that they

represent the resentment of traders who have been "taken in" by the Germans. The usurer's method is often successful for the individual: it is never successful for a people or a nation. Cheat and oppress a man and you may put money in your pocket, but you make an enemy who will repay in kind: on you if he can, on your children and your race if you escape. When Mr. Anderson and others talk thoughtlessly of German success they lose sight of the great and final proof of that "success," as shown in the world-wide hatred and contempt which Germany now enjoys and has fully earned. We need not advise British engineering firms not to follow a course which is not in their minds. They will certainly continue in that British conservatism which some people ask them to discard. They will sell their machinery on credit terms such as are usual and safe for producers, making the best bargain they can; but they will make a bargain which at the end of each transaction leaves both buyer and seller free to enter into future transactions with independence and mutual respect. If Russia wants capital which we can supply, let her obtain it by loans through banks or regular financial agencies, or as shares in her own companies subscribed by British shareholders. If Russians follow that legitimate method they will get their capital cheaper and retain their independence. If Russian commercial law stands as much in need of reform as Mr. Anderson states those laws can soon be amended. Any firm which sells machines on the "pay when you can" German terms mentioned by Mr. Anderson deserves no sympathy if they never get payment. If Russians want British machinery or any other goods they have in the end to pay in Russian corn, or some other produce of Russian labour. The only honest exchange is that of equal values embodied in different kinds of useful products. Commerce based on that principle is mutually beneficial. A cultivator who cannot very well or economically make a spade can quite easily cultivate a few yards more land than he wants for his own food and give the extra corn to a spade maker in exchange for a spade. One will have a better and cheaper spade than he could make, the other will have more and better corn than he could grow, and each will have done an equal number of hours' work for the other. All the elaborations of modern industry, shipping, and banking are only a highly developed form of this barter exchange. If the simple honest founda-

tion of the exchanges is replaced by a system of getting spades or corn by cheating, then a day of retribution will assuredly come, for in the end the accounts must balance, whether in blood or money. Russia has obtained a good deal of capital from this country, and more from France, but both countries stand well in Russian esteem. A very large amount of German capital has been created in Russia by the German method, and Germany is detested in Russia. These crops, of respect and detestation, are the results of the different methods which Mr. Anderson has failed to analyse correctly. On many minor points Mr. Anderson's paper will meet with general assent; but in one respect he was not very candid. Having quoted with approval an article from the Journal of the Russo-British Chamber of Commerce, which gives chief place to the German-Russian Commercial Treaty, by which German goods obtained preferential tariff rates, he evades this question and declares that "the one determining factor . . . is commercial organisation." Commercial organisation is of no use against a hostile tariff and that is one of the reasons why British producers do not develop such an organisation. On equal tariff terms the commercial organisation counts for a very great deal. Business men are getting rather tired of sermons on organisation, polyglot catalogues, and what not. They quite understand these elementary matters and would prefer to have some more thoughtful results of the experience of those who travel. Russia will remain a protectionist country; she may be inclined to enter on tariff terms which will be mutually beneficial to all the Allies. If we are to trade more extensively with her, that question cannot be ignored, and we ought to see if we can meet all our Allies in such an arrangement. In any case, Russia is not fighting without a cause: she is fighting for the right to live in her own way in independence; and having won that right, as she assuredly will, she will remember the cost and not part lightly with it again. If we want to do business with her we must talk sense on the large issues and be prepared to make terms which will bring about fair exchanges and maintain independence and self-respect on both sides.

The rivalry of nations for trade expansion cannot continue indefinitely. It points to no stable economic condition: in fact, it presupposes that each nation can only live

by commercial disaster to the others. Men will have to turn their thoughts to a form of commerce in which each nation will make its internal welfare the first consideration and its foreign trade a complementary part of its economy. Steady production, regular work, the elimination of class antagonisms, must become the chief purposes of industrial organisation. The nations that adopt such a policy will be able to regulate their mutual commerce and constitute an alliance so powerful that German or any other schemes of world domination will be easily defeated, perhaps by economic pressure alone.

#### REPLY TO THE *Practical Engineer* ON BRITISH TRADE IN RUSSIA.

There has been brought under my notice a leading article in the *Practical Engineer* of 2nd inst., which professes to be a criticism of the paper which I had the honour to read before our Institute. That criticism, while stated to be "genial," is on the face of it very destructive, and many of the assertions are of a most sweeping nature. Wide general statements are of little use at any time, and are invariably misleading, if not untrue. I am rather surprised to find the following: "Our Russian friends must not judge British commercial methods by the description of them given by Mr. Anderson, or any other writer." If the writer of that article really intends the Russians to believe this, then I do not understand why he criticises and particularly why he takes the trouble to tell our Allies that after the war is over British engineering firms "will certainly continue in that British conservatism which some people ask them to discard" for "any other writer" surely includes himself. Reading further on in the paper, however, I became more than astonished to find that the article was written by one who, admittedly, had no first-hand knowledge of Russia nor even an acquaintance with the commercial laws of that country. It is perhaps only right to point out that the writer of that article mentions that "If Russian commercial law stands as much in need of reform as Mr. Anderson states, those laws can soon be amended." My paper was an attempt of a practical nature, taking the conditions as they are, and did not embrace all trade with Russia, when, if ever, she has laws such as we would desire. We all know the difficulty and at times the almost impossibility in the lifetime of the ordinary man in having the defects and hardships in the laws of our own country corrected. A knowledge of Russian history or even a perusal



of the monumental work of Sir Donald Mackenzie Wallace, will, I think, convince anyone that the position is still worse in Russia. I have no desire to make what may seem unkind remarks regarding the Russians, their constitution, or laws, but as business men we must deal with facts.

If the writer of the article referred to had desired to deal "genially" with my remarks then he might first have given them in full (instead of summarising them) and have pointed out that the time at my disposal was limited, and the subject a very large one. To suggest as he does that I had any idea of treating the subject politically is unfair, or to suggest that I even hinted at British engineers using methods to "oppress and enslave" those who do business with them is in my view to insult the members of our Institution.

With these comments I leave my paper to be read as a whole by business men with an unbiased mind.

## ELECTION OF MEMBERS.

The following were elected at a meeting of Council of the Institute held on Tuesday, November 9th, 1915:—

### *As Members.*

Archibald Walker, Bank Chambers, Lambton Quay, Wellington, N.Z.

Peter Macgillwray Black, 11, Mycenae Road, Blackheath, S.E.

Henry George Rose (Cavalier), via Nizza, 1/4, Genoa, Italy.

Robert John Stewart, South African Iron Works, 23, Rose Street, Cape Town, South Africa.

### *Transfer from Graduate to Associate-Member.*

S. V. Reynolds, 180, Clement's Road, East Ham, E.