THE TRADE UNION ATTITUDE.

To-day the opportunity has passed, for there are many factories in England as well equipped as any in America, and though trade union tyranny prevents the machinery being run to its full capacity, the chief losers are the men themselves. Their weekly earnings are less than they need be, but most smart manufacturers have been, by the aid of machinery, able to reduce the labour cost per dozen to somewhere about the American level. The men seem to think that if they did more they would get no more pay—which is a poor tribute to the power of their union. They also appear to adopt an altruistic attitude towards each other, one man fearing to do too much lest he should either rob his fellow-workman of employment or set him an inconvenient pace.

No one objects to working men doing all they can to improve their wages, but a man who deliberately does less than a fair day's work is injuring himself and injuring the whole community as well. If the policy of shirking work were really beneficial to the working classes, then no workman ought to do any work at all.

Here it may be convenient to explain that at the time of which I am writing (1891) productive wages in an English shoe factory would average about 33½ per cent. on the wholesale selling price of such goods as were then in demand.
A popular gentleman's boot was sold at about 8s., and a ladies' at 6s. (factory prices). This would mean that about 2s. 8d. and 2s. respectively would be distributed in the productive wages of manufacture. I have spoken of extreme cases in America where I found a saving of 50 per cent. in wages. This was in lower grade goods than are the subject of the present illustration. The productive wages paid in the best American factories on such boots as I have instanced were at the time of my investigations about 1s. 9d. and 1s. 3d. respectively. This meant that the American shoe manufacturer had an advantage over his possible English competitor of 11d. per pair in one case and 9d. in the other. This would have been more than enough to enable him to swamp the market had he addressed himself energetically to the task.

TARIFTS AND INEFFICIENCY.

Surplus stocks of boots and shoes cannot, however, be easily dumped out of one market into another. The styles and fittings that would suit New York would not suit London, and what would suit London would not suit Glasgow. The width of the average foot in proportion to its length varies in different countries and even in different parts of the same country. A comfortable fit being the essential thing, all orders are specially manufactured for the market for which they are intended. Boot manufacturers, therefore, are seldom the victims of
dumping except at the hands of a bankrupt fellow-countryman. Still there was nothing to prevent the American shoe manufacturer copying our lasts and styles (which has since been done to a limited extent) and utilising his cheap labour (as measured in productive cost) for the purpose of underselling the British shoe manufacturer in his own market. For the latter did not have the protection of a tariff behind which he could shelter his badly-equipped factory and his lazy workmen.

Supposing we had had a tariff of, say a shilling a pair on American boots and shoes, what would have happened in the circumstances I have named? Obviously neither manufacturer nor workman would have troubled to bestir himself to make the much-needed changes that were necessary. We should therefore have been protecting incompetence. Under Free Trade the British industry had to pull itself together, and in doing so it has not only benefited itself, but it has benefited the entire community. And incidentally it has been able to increase its export trade, particularly during the past three years, when the work of reorganising the factories began to have its natural effect. To be sure we have suffered some loss of trade by the American invasion which was attempted so soon as our friends on the other side realised the opening which our years of lethargy had made for their products. But as the following figures show, our imports are trivial in comparison with our home
production, and are much smaller than our exports. And we shall get the trade back again. Meanwhile the imports acted as an object-lesson to our manufacturers and educated them more than anything else could have done to the needs of the situation. I believe the lesson was cheap at the price paid for it.

**Boots and Shoes.**

<table>
<thead>
<tr>
<th>Nine months ended September,</th>
<th>Imports. £</th>
<th>Exports. £</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901</td>
<td>686,000</td>
<td>1,136,000</td>
</tr>
<tr>
<td>1902</td>
<td>626,000</td>
<td>1,276,000</td>
</tr>
<tr>
<td>1903</td>
<td>677,000</td>
<td>1,427,000</td>
</tr>
</tbody>
</table>

The imports in the above table are calculated after deducting the re-exports, and consequently represent our home consumption of foreign-made boots and shoes. A little over half of these are American, the rest being from France, Switzerland, and Austria, with each of which countries we do a limited trade, which has been going on without much fluctuation for many years. The American imports did not commence in earnest until 1895. They grew rapidly until the period covered by the table given, when they seemed to reach the stop-point. Quite half of the American boots and shoes now sold in this market are retailed by the manufacturers direct to the public. They took the shops when it seemed easy to sell American goods in England, and as it would involve considerable loss to close them they may remain open for some time
yet, but under existing conditions the withdrawal of American competition in the shoe trade of the United Kingdom is only a question of time. Already many of the American agents have returned home and have given up the attempt to do an ordinary wholesale business. And at least one has abandoned his American agencies and is now selling English goods.

The Home Market.

To see the figures of our imports and exports in their proper perspective it is well to remember that we have a population of 41,000,000 of people in the United Kingdom, and they nearly all wear shoes of sorts. If we put the annual outlay per head of the population on footwear at £1 we shall not be far out. This estimate means that our home consumption of boots and shoes amounts to the enormous value of £41,000,000 per annum. Nearly all this great trade is kept at home, the proportion of it accounted for by imports being inconsiderable. In the boot and shoe industry, as in many others, the part played by our over-sea trade, either inwards or outwards, is so small that it does not justify the pother made about it. The public mind, however, seems to be hypnotised by the contemplation of the foreign trade of our own and other countries and overlooks the much larger and more profitable business at our own doors.

I have already written as to the average cost of
productive labour in the modern manufacture of boots and shoes, and shown how it has been reduced by the adoption of improved methods forced upon us by most salutary competition. It may be worth glancing further at the benefit which the public has thus derived from the reorganisation of British boot factories.

A recent estimate issued on the authority of the Federation of Boot Manufacturers Associations places the annual consumption of boots and shoes at 100,000,000 pairs. This is probably within the mark. I estimate that the new machinery and improved organisation adopted by British boot manufacturers within the past ten years have enabled them to effect a saving averaging quite sixpence per pair. The whole of this saving has had to be given to the public, because the re-organisation of the factories has expanded their productive capacity and induced a very active state of competition. Indeed, at the present moment the trade is paying the penalty of its previous lethargy, and is suffering from a sharp attack of over-production. The changes came about so rapidly that the market has been glutted and is likely to remain so until the normal growth of demand has overtaken the increased capacity for supply. In such circumstances it has been impossible for manufacturers to keep for themselves any of the advantages derived from their new machinery. It follows, therefore, that the public has reaped a benefit now equal to about £2,500,000
a year for improvements in manufacture which would not have been adopted for many years under a protective system.

**Competition and Efficiency.**

But let me hasten to add that little, if any, of this benefit has been conferred in the shape of reduced prices. It has mainly taken the form of improvements in the article produced. For example, ten years ago the great middle-class trade was furnished with a boot sewn on the Blake machine to which allusion has already been made. To-day the same class of trade is supplied with what is known as Goodyear or machine-welted boots at approximately the same price. This welted boot is made precisely on the same principle as the old-fashioned hand-sewn boot of thirty years ago, and which may still be obtained of a few fashionable West-end boot-makers by people who can afford to pay the price it commands. Its exact equivalent made by machinery is now within the reach of all, and it has largely supplanted what is known as the ordinary machine-sewn boot. In many other ways too, improvements have been effected in the finish and embellishment of the modern factory-made boot, which is also of better design and fit than its counterpart of only ten years ago. All these advantages have been given to the public without any extra charge, and it has been possible to give them because of the adoption of the American
system of manufacture, which in turn was the outcome of direct American competition in the boot market. This competition would have been shut out by even a moderate tariff.

One further observation is worth making in this connection. The workman has not suffered, by the alteration of methods and the reduction of cost of production I have described, any diminution either of his individual earnings or in the total amount paid in wages. Individual earnings are better, and the money paid in wages has, if anything, increased owing to the much greater elaboration of detail and the substitution of the welted boot for the old machine-sewn article. When manufacturers used to calculate that productive wages should average one-third of the factory selling price they were figuring on a boot of simple construction. Such a boot to-day need not involve for productive wages more than 20 per cent. of the factory selling price. But it is not largely made. Its place has been taken by a more highly finished and better article of a similar kind, or by a boot made by the somewhat complicated welted process. It thus remains that the old calculation of 33 1/3 per cent. for productive wages is generally adhered to by manufacturers. There has been some hardship experienced among the older men unable to learn how to operate the new machines. Younger men have had to be drafted into the factories and considerable displacement of labour has been inevi-
table. But this was the price that had to be paid. Regarded broadly, the position of the workman has been improved by the reorganisation of the factories. The most serious drawback has been that in filling their factories with new machinery manufacturers have been compelled to increase their trade in order to get the best results from the new appliances. This had led to an expansion of productive capacity which will presently find its proper level by the natural operation of the laws of supply and demand.

NOTE ON THE LEATHER TRADE

The shoe and leather industries are so interwoven that this chapter would be incomplete did it not take note of the great changes which have taken place in the leather trade during the period under review.

When the Corn Laws were repealed tanning was a scattered industry. Every important town and many large villages, especially if they were near to oak timber and a stream, boasted a tanyard. These yards were in the hands of men who had been born in the business, as their fathers had been before them. Many of them ranked with the country gentry, and they not infrequently had considerable landed interests. Tanning was an eminently respectable trade, as it implied the
possession of either large capital or good credit, on account of the length of time taken to turn the hides into leather. Moreover, it was a leisurely occupation which gave ample time for hunting, fishing, shooting, and country sports. But it had no attraction for the captains of industry who were then emerging into the position of prominence and usefulness they now enjoy.

One other fact it is well to remember in relation to the tanning trade. Its basis rests upon the utilisation of a by-product. Hides and skins (except valuable furs) are not taken from the animal until the animal is wanted for food. The tanner is therefore in a position of comparative helplessness as regards the supply of his chief raw material. The local tanner had to rely upon local hides, and when altered conditions diverted his natural supply he was not the sort of man to follow it. He just closed the yard and betook himself to farming or some other congenial pursuit. Many tanners, of course, obtained supplies of hides from London factors to whom they consigned the finished leather for sale in due season. But the factor made the big money while the tanner was satisfied with small profits coupled with the delights of a country life.

Just one other fact worth noting is somewhat curious. In a fairly extensive experience I have neither met nor heard of a successful tanner whose father before him was not also a tanner. It seems
to be a sort of mystery business, and even under modern conditions the hereditary tanner has a strange advantage which I merely put on record without attempting to explain.

A trade with such a history and such associations was naturally not equipped as to its *personnel* to grapple quickly and successfully with the changes which have taken place during the past sixty years, both as regards the source of supply of raw materials and the markets in which the finished products could be sold. In short, British tanners have been for years remarkable for sleepiness, though some of them have remained fairly wide awake throughout and the rest show satisfactory signs of awakening. Meanwhile they have undoubtedly suffered more from the effects of foreign competition than their allies, the boot manufacturers.

One potent reason which helps to account for the inroads made by American and continental leather producers in the English leather market is the fact that the distributing trade was until quite recent years almost in the hands of merchants. The tanner did not sell direct to the boot manufacturer. He was not in touch with the consumer, and the merchant bought leather wherever it was offered, and was usually very active in finding bargains which happened to lie about in the markets of the world to resell in competition with the product of the British tanner. And it is almost entirely due to the efforts of the middleman that
so much foreign leather now finds a market in this
country. He has a special interest in pushing
foreign leather in the many cases where he can
obtain an exclusive agency for its sale. The boot
manufacturer can readily pass by the merchant
and deal with an English tanner direct. It is more
difficult when the leather is imported from an
unknown or "tied-up" source, so the merchant
prefers to push the foreign article.

Again, the English leather producer has been
until quite recent years exceedingly conservative
in his methods of tanning. His art was ancient,
and he thought it could not be improved upon.
Happily all this prejudice is breaking up. The
pressure of foreign competition has at last made
itself felt and the English tanner and leather manu-
facturer (the terms have a slightly different technical
meaning) is waking up, and will, I doubt not, assert
himself as the English boot manufacturer has done.
The tanner is, as a rule, a richer man than the manu-
facturer, and so it took more pressure to stir him
into action. The mere threat of effective American
competition in the shoe trade brought about a
veritable revolution. The English tanner is
estimated to have lost about a third of his
business before he woke up.

Could he have slumbered peacefully on the
sunny side of a tariff wall he would have been
asleep now.
FLOUR MILLING UNDER FREE TRADE

By Andrew Law

(Of Crawford & Law, Glasgow)

ROUND the farm and the mill poetry and sentiment have revolved during so many ages that the task of considering them in their commonplace commercial aspect is a somewhat thankless one. Yet when the poetry and sentiment are evaporated, we see left two closely related and mutually dependent industries subject to the ordinary commercial conditions and limitations which surround other industries. The development of the second of these industries—the milling industry—since the repeal of the Corn Laws will be the better understood after a few observations on farming during the same period.

Farming is a manufacture and the farmer is a manufacturer, and his industry has been affected by the same causes which have affected all other
industries. Just as elaborate spinning and weaving machinery have superseded the spinning-wheel and the handloom and so added immeasurably to the productive capacity of the individual factory operative, so have the application of scientific methods, and especially modern tools and machinery, to agriculture increased the productive capacity of the farm operative. But while the number of looms in a factory can be indefinitely multiplied, the agricultural acreage is a fixed quantity; consequently the increase in the productive power of the individual farm labourer led to a lessened demand for labourers, while at the same time the growing industries of the towns held out superior inducements in the form of higher wages and greater opportunities for advancement. And here, too, the development of the railway system has had an enormous influence in carrying to and from the farm with expedition goods which under old conditions had to be conveyed by horse-power to and from the nearest market town. Here, indeed, are to be found the principal causes of the rural depopulation which is usually attributed to one cause alone, viz., the repeal of the Corn Laws. Undoubtedly the repeal of the Corn Laws was one of a number of contributory causes, but it was probably one of the least important. The consolidation of small into large holdings, the general use of light chemical manures, involving little labour in their application, the marketing of grain by sample and forwarding it by
rail without carting the stock to the nearest market town, have all tended to the economy of labour. Beyond all other causes, however, the introduction and extending use of good tools, and especially of scientific labour-saving machinery, have operated in economising farm labour. Under the old system of hand sowing and hand reaping so much labour was wanted on the farm in seed-time and harvest that the farmer, to make sure of having it at his command when wanted, had to maintain a great many people all the year round, who, having very little to do for the greater part of the year, had to be content with mere subsistence wages. The necessity for economy in every direction, brought into operation by declining grain prices, stimulated ingenuity, and gradually farming tools and machinery were so improved that, except in very unfavourable seasons, the amount of farm labour wanted is not now much greater in seed-time and harvest than at any other season.

During the same period, however, the same causes were operating in the other grain-growing countries, and particularly, and even in a greater degree, in the United States. It is well enough known that the cost of carrying wheat from Chicago to Liverpool is a mere fraction of what it was forty years ago, but it seems to be overlooked that a greater reduction still in the cost of conveyance from the Western American farm has been brought about by the development and extension of the American Western
railway system. This has certainly during the same period reduced the cost of conveyance from the farm to Chicago even more than the reduction in the freight from Chicago to Liverpool. But this reduction in the cost of American wheat naturally enough discouraged the growth of wheat in Great Britain. Farmers found it more to their advantage to apply their land to other purposes, and so we find that while about the year 1846 our home growth of wheat averaged about 16,000,000 quarters, our imports of wheat and flour in that year were returned at 2,405,000 quarters; the figures for 1900 were 6,790,000 quarters and 23,390,000 quarters respectively.

The importance of those figures when the question of milling comes to be considered is obvious. They point to a complete change in the localities in which milling can be profitably conducted. From the earliest times and till within the last fifty years the art of milling made very little progress. The grain, more or less freed from impurities, was ground between millstones, and the bran, to which a good deal of the most nutritious portion of the wheat adhered, was sifted out. Mills were mostly of small capacity, and were scattered all over the country, most of them grinding local wheat which, if they were near the seacoast, they might fortify with a mixture of strong, dry foreign wheat. The gradual decline in wheat prices and the increase in numbers of the population made it more profitable for farmers
to produce meat and milk, and necessarily restricted the growth of wheat. At the same time the development of railways radiating from the great ports tended to centralise the milling industry there, and so step by step with the decline in country milling came an expansion in milling at the great import centres.

But along with this again came a complete change in the milling system. The most important element in this change was the substitution of steel rolls, and the gradual reduction process, for the ancient millstone process which reduced the wheat to flour at one operation. This process originated in Hungary about forty years ago, and, as operated there, was and is a complex process. The Americans adopted the Hungarian process about thirty years ago, and while adhering to it in all essential particulars, they greatly simplified and adapted it to their own special conditions. Within a few years thereafter the American millers began exporting what was then known as "new process flour," directing their attention mainly to the British markets. The quality of this flour was so high in proportion to the prices at which it was sold that it was universally believed to be mere surplus stock disposed of at a loss in order to permit of American millers running their mills to full capacity and so enabling them to make good profits out of their home trade. Consequently British millers waited confidently for the time when the flow of this
imported flour would cease, meantime experimenting tentatively and cautiously in the new process themselves. It came to be gradually known, however, that there was money in "new process milling," and that the American millers had really been making large profits on their export sales. As soon as the millers of Great Britain realised this they set to work and remodelled their mills, and are now able to compete on equal terms with millers in any part of the world.

As a matter of fact flour milling is a highly profitable industry in the great wheat-importing centres or wherever in the country there are sufficient and regular supplies of home-grown wheat, provided the mills are up to the modern standard. There is no evidence whatever that Free Trade has done a particle of injury to flour milling, although it has certainly been one of a number of causes which have changed the localities in which it is conducted.

On the other hand, Protection in itself could not help it. The reason why many flour millers would like a return to Protection is that in the adjustment of the tariff as between imported wheat and flour, the ratio would probably be arranged so as to discriminate against flour, and thus operate as a bounty to them. The history of the recent short-lived corn tax illustrates this point effectively. Flour is not the only production from wheat, nor do all kinds of wheat produce the same percentage of flour. When Sir Michael Hicks-Beach imposed the tax
of 3d. per cwt. on wheat he consulted the British millers as to what would be the proper tax to place on imported flour, and was advised by them that 5d. per cwt. on flour was equal to 3d. per cwt. on wheat. Now as 112 lbs. of ordinary average foreign wheat will produce about 80 lbs. of flour and 30 lbs. of by-products (known as offal and used for cattle feed), the tax should have been rather more than 3½d. on wheat if 5d. on imported flour was taken as the starting-point. The ratio of 3d. and 5d. was avowedly adjusted to meet the case of dirty wheat, and wheats of poor flour-producing capacity, and so of course in using the clean, dry wheat of high flour percentage usually imported it operated as a bounty. But here again another point emerges. The ratio of 3d. and 5d. ignored the offal and permitted it to come in duty free, while it was raised in selling value by the amount of the import duty levied on other competing grains used for cattle feed. When the corn tax was removed it was stated that the millers, depending on its permanence, had spent a great deal of money in enlarging their mills, and that its removal was a great injustice to them. After the Corn Tax was removed the Protectionists in the House of Commons undoubtedly greatly exaggerated the advantage the millers had enjoyed, which could not really be shown to exceed 3s. per ton of flour produced, but even this advantage certainly enabled them to increase their production materially
during the year the corn tax was in operation. This, however, necessarily involved the production of a larger quantity of offal, and as the home market for this class of cattle food is not capable of great expansion, an outlet had to be found for a larger quantity than usual in the Baltic countries, particularly in Denmark. There is always a large demand on Danish dairy estates for offals at low prices, and the offal bought from Great Britain in due time finds its way back in the form of Danish butter and bacon.

The case of the English country miller remains for consideration. The number and importance of country mills necessarily declined with the reduction in the growth of wheat, and of those which remain in the business many find their best line of competition in fortifying their soft, sweet home flour with a mixture of strong imported flour. An import duty on wheat to be of any benefit to them would therefore require to be heavy enough to raise prices to the level which would stimulate the home growth. A protective duty which stopped short of this, and at the same time discriminated against imported flour, would tend to give the port millers absolute control of the trade, and they would naturally find it convenient to ship their offal in large lines to the Continent at low prices, which indeed is the practice already.

This naturally leads up to the so-called "dumping" of American flour in British markets; and it
may be confidently stated that if dumping means
the systematic selling of goods at a loss, there is no
dumping of either American or British colonial
flour in Great Britain. Millers on the North
American Continent are working with the ordinary
object of making a profit. Some of them export
nothing, some of them cultivate part home and part
export trade, and some cultivate an export trade
almost exclusively. Before British millers modern-
ised their mills, and the margin of profit was large,
American flour was frequently consigned for sale
on arrival; since the British millers improved their
mills, and so cut down the margin of profit on
Transatlantic flour, both American and Canadian
millers have made a practice of selling their flour
outright before shipping it, and the only kind of
dumping they do is the same kind of dumping
which British millers do with their offals, and which
indeed is the rule with all manufacturers, viz., they
sell their goods on a narrow margin of profit where
the order is large and the expense small, because
all the profit is net without deductions.

Neither is there any such thing as an American
Milling Trust. An attempt was indeed made five
years ago to organise a milling trust, but it quickly
ended in disaster. None of the conditions which
go to the successful formation of a trust exist in
the milling business as it is conducted in America.

The competition between British millers who im-
port wheat, and foreign and colonial millers who sell
flour in British markets, is at present perfectly fair, and their enterprise and the strenuous competition of a free market have secured for the people of this country a supply of bread which, relatively to its high quality, is certainly the cheapest in the world.

How high Protection affects milling can be seen in the case of France, which levies a duty of 12s. 2d. per quarter of 480 lbs. on imported wheat. France is nearly self-supporting in the matter of wheat supplies, and yet this duty of 12s. 2d., acting as an impassable barrier against imports until the price rises to at least 12s. 2d. per quarter above the open market level, was sufficient to keep the price of wheat in France on an average of the last five years 9s. per quarter higher than the open market price. But a fiscal system of this kind leads to great instability in the level of prices, values rapidly mounting to an import level in times of scarcity and sometimes sinking to international parity in times of abundance. Now and again, indeed (as for about two months during the high-price year 1898), it is necessary in deference to public opinion to suspend the duty entirely. The French milling industry, therefore, is by no means so prosperous as the British industry, where the conditions are simple and the level of prices comparatively stable. The only section of the French people who have certainly profited by the French protective duty are the owners of corn-growing farms, and their position is protected by the fact that the quantity of land suit-
able for corn-growing cannot be increased, and therefore they have a secure monopoly. There is no limit to the number of mills which can be built, and France is notoriously over-provided with mills; but here again one of the usual results of high Protection discloses itself. To permit of French millers doing an export trade the duty paid on imported wheat is supposed to be refunded in the form of a drawback on the equivalent production of flour, but in practice the French millers contrive to extract from the French people what amounts to a bounty on their export sales. A certain production of flour is assumed, and the duty on the wheat is adjusted on this assumed basis. In reality the wheat produces more flour than the assumed quantity, with the result that the miller makes a profit on the drawback. It is therefore sometimes possible for the French miller to import wheat from America and Russia, mill it, and deliver the flour in Great Britain at a lower price than that at which the same flour can be manufactured when the wheat is imported direct and ground in Great Britain.

If a protective duty should be imposed on wheat and flour with a discrimination against imported flour, the port millers of the United Kingdom would in the first instance reap a direct benefit, but the country millers could not reap any benefit at all unless the duty increased the growth of English wheat. On the other hand, it is probable that mill-building in the ports would be overdone as in
France, and the competition amongst the millers themselves would speedily bring the margin of profit down to the lowest point consistent with continued existence. At the same time an unmanageable quantity of offal would be produced for which the port millers would find their best market in the Scandinavian countries, principally Denmark and Sweden, both of which countries admit mill offals, duty free. The importance of this consideration will be seen at once when it is stated that Sweden and Denmark in the year 1900 imported 690,000 cwt. British mill offals; in the year 1901, 923,600 cwt.; and in 1902, 1,106,100 cwt. It is therefore plain that any system of grain import duties which favoured the port millers would necessarily have to be accompanied by a protective duty on imported continental dairy produce or by an exemption from duty of coarse grains used by English farmers for feeding cattle.

It is perhaps at this point that the bargaining power which seems to be an inseparable feature of the new Protection might come into operation. This bargaining power, of course, has two sides. While the Government is bargaining with Foreign Powers, our protected industries, like protected industries in all protectionist countries, would be bargaining with the Government, and, of course, the richest and most concentrated industries in such a contest would have the best of it. British milling is not a highly concentrated industry, and possibly when it
came to a question of bargaining it might get the worst of it, and find its protection traded away for the benefit of some more powerful industry.

In view of that serious possibility, British millers may be advised to bear the ills they have, and under which they manage to live and prosper, rather than to agitate for a change which if effected might eventually bring disaster in its train.
THE IRON AND STEEL TRADE

By Hugh Bell

"I soon found out the Person's House to whom I was recommended, presented my Letter from his Friend the Grandee in the Island, and was received with much Kindness. This great Lord, whose name was Munodi . . . was a Person of the first Rank, and had been some years Governor of Lagado . . . The Sum of his discourse was to this Effect. That about forty Years ago, certain Persons went up to Laputa, either upon Business or Diversion, and after five Months' Continuance, came back with a very little Smattering in Mathematics, but full of Volatile Spirits acquired in that airy Region. That these Persons upon their return began to dislike the Management of every Thing below, and fell into Schemes of putting all Arts, Sciences, Languages and Mechanicks upon a new Foot. To this End, they procured a Royal Patent for erecting an Academy of PROJECTORS in Lagado; and the Humour prevailed so strongly

1 Mr. Chamberlain was about three months in Africa.
among the People, that there is not a Town of any
Consequence in the Kingdom without such an
Academy. In these Colleges, the Professors con-
trive new Rules and Methods of Agriculture and
Building, and new Instruments and Tools for all
Trades and Manufactures, whereby, as they under-
take, one Man shall do the Work of ten; a Palace
may be built in a Week, of Materials so durable as
to last for ever, without repairing; all the Fruits of
the Earth shall come to Maturity at whatever Season
we think fit to choose, and increase an hundred
Fold more than they do at present, with innumera-
able other happy Proposals. The only Incon-
venience is, that none of these Projects are yet
brought to Perfection, and in the meantime the
whole Country lies miserably waste, the Houses in
Ruins, and the People without Food or Clothes.
By all which, instead of being discouraged, they are
fifty times more violently bent upon prosecuting
their Schemes, driven equally on by Hope and
Despair. . . .” (A Voyage to Laputa, &c.)

If the strange enigma who walked among men
under the name of Jonathan Swift had lived in
London in 1903 instead of two centuries earlier, his
bitter humour could hardly have expressed more
incisively than is done in the passage I have quoted
his appreciation of the situation in which this
country now finds itself. Great Britain of to-day
resembles in all particulars the country which, in
the kingdom of Laputa, was under the control of
Munodi. "Neither do I remember," says Gulliver, "ever to have seen a more delightful prospect." Her wealth, measured in what way one pleases, is enormous, and is growing. The condition of her people has improved decade by decade, as is shown by their expenditure, by their savings, by their vital statistics, and in every other way in which well-being can be estimated. Pauperism has diminished. Incomes and wages are much larger than they were thirty years ago. The very paupers themselves are more than twice as well off as they were half a century since. In 1854 the amount expended per head in England and Wales was £6 2s. 2d.; for the quinquennium ending with 1899, £12 18s. 5d.; and for 1902, £14 8s. 4d. One feels almost compunction at being obliged to add that the percentage had fallen from 4.6 in 1854 to 2.6 in the quinquennium 1895–9, so that relatively only about 55 per cent. of the proportion of 1854 take advantage of the greatly improved conditions of to-day. These statements are based on returns the truth of which is, I believe, not questioned. But no observant man can move about the country without being struck by the immense improvements which have taken place. Every town of importance is surrounded by suburbs filled with comfortable houses, public parks abound, schools, often almost palatial in appearance, are scattered about at convenient intervals. Even the great and thorny question of the housing of the working classes appears to be solving itself, for,
viewed as a whole, overcrowding tends to diminish. In a word, no sign of material well-being is wanting. These facts are not set down in any spirit of supine optimism which ends in a “rest and be thankful” sigh. But it is well, while every paper is full of complaints about our trade and its future, to call attention to signs of prosperity which those who contrast our imports with our exports pass by without notice.

It is with this condition of domestic well-being that tariff reformers ask us to interfere. We are forbidden to consider anything which shows we are prosperous, and are invited to concentrate our attention on circumstances which are held to demonstrate our approaching ruin. Having reduced us to a state of abject alarm for our future, our new philosophers, like those of Laputa, would persuade us to accept as a cure for a malady, of which we deny the existence, a remedy which we say would be of no avail even were the facts as they are represented.

The grounds for our refusal can only be found by examining with care the condition of the trades for which our medicine-men propose their nostrums. Among these trades the great iron industry stands pre-eminent. It is noteworthy that all those who favour the fiscal reforms with which, in terms “changeful, vague, importunate and loud,” we are threatened, draw illustrations from this trade. On the one hand they magnify, quite properly, its
importance, while on the other they dwell on the peril in which it is supposed to stand. Its rapid growth and its present magnitude are held up to our admiration, only to inspire terror at the prospect of its imminent ruin. And having flattered our efforts in the past, and alarmed us for our position in the future, they leave us without any clear idea as to what is to be done to avoid the disasters with which we are menaced. Now it is interesting to observe that for at least three centuries this trade has been the chosen battle-ground of those who, for one reason or another, considered it the function, and indeed the duty, of the State to provide against evils which it was thought would flow from the un-regulated development of commerce and industry. Mercantilism, with all its strange offshoots, was but the outcome of the opinion that buying and selling could not safely be left to the buyer and the seller, but must be controlled by the wiser brains to whom was entrusted the government of the world. A sanction, higher than any mundane power, gave authority to these interferences and the will of the Almighty, as conveyed through a sovereign whose divine title was accepted, was, in ultimate recourse, adduced to silence all doubters. I justify this statement by one example, where many might be cited, when I point to the usury laws. "In former times," says Blackstone, "many good and learned men were opposed, from doubts about its legality in foro conscientiae, to any increase of money by way
of interest—an hostility which they grounded . . . on the prohibition of it by the law of Moses among the Jews. . . . Hence the school divines branded the practice of taking interest, as being contrary to the Divine law, both natural and revealed; and the canon law proscribed the taking of any, the least, increase for the loan of money as a mortal sin.”

When so wide a view of the function of the government was taken it is not surprising that the greater was assumed to include the less, and any plausible ground of public policy, any suggestion of moral advantage, was seized with avidity as justifying interference. In the reign of Elizabeth, therefore, we need not be astonished to learn that the preservation of the timber trees of Kent and Sussex warranted interference with the iron trade of those counties. Two centuries later, the tanners of the kingdom alarmed the legislature by averring that the decay of the iron trade was making wood valueless, and asserted that if something were not done coppices would be grubbed up, and there would be neither oak for shipbuilding nor bark for tanning. Dip into the records of the iron trade where we will, we may be sure to find the same story. Swedish iron shall be prohibited admission to this country for the benefit of one set of people, or shall be admitted for the profit of another. The importation of iron from the American colonies shall be encouraged lest the manufacturers there “be forced to work it themselves, to the great decay and prejudice of the iron
trade in this kingdom.” (From a Petition to the House of Commons in 1736.) A century earlier, in 1637, Charles I., by proclamation, ordained that pigs of iron made in England were to be marked by his surveyors and that iron was not to be exported without his license. In these days of coal-export duties it is amusing to read Ralph Gardener’s Petition of 1655, praying for “a revival of the never-to-be-forgotten statute of 11 Rich. II., cap. 7 (1388), for a free trade to all, which voided all monopolies and charters, as being the greatest grievance in a commonwealth.” He urged that this would not only “make England equivalent to Venice, Holland, and other free rich States, in riches, but preserve timber, and reduce coals under 20s. the chalder all the year at London.” But most remarkable of all is the pamphlet dated 1756, and entitled—

The
CASE
of the
IMPORTATION
of
B A R - I R O N
from our own
COLONIES OF NORTH AMERICA;

Humbly recommended to the Consideration of the present Parliament, by the IRON MANUFACTURERS of Great Britain,
which is reprinted in the second volume of the "Journal of the Iron and Steel Institute" for 1887. Adam Smith's "Wealth of Nations" was published in 1776. At the date of the pamphlet to which I am referring he was thirty-three years of age. But for these dates we might suppose the iron manufacturers of that day had got their political economy from the founder of modern economics. I should like to reprint the whole document, but the space at my disposal forbids this. I must, however, set out in full the "Preliminary Propositions" :—

"I. There cannot be a clearer Proposition concerning Trade, than, That it is the Interest of every Manufacturing Country to get as great a Choice and Variety of raw Materials, and upon as cheap Terms, as can possibly be procured. For an Error in this respect, is fundamental, and hardly to be corrected by any subsequent Care or Diligence. Therefore the Legislature hath wisely ordained, That though Wool, for Instance, grows in greater Plenty in England than perhaps in any other Country, yet the Wools of all Nations shall be admitted into England Duty-free; justly considering, That we can never have too great a Choice and Plenty of that necessary Material of extensive and profitable Industry, or upon too cheap Terms."

"II. A second Proposition, not inferior either in evidence or Importance is, That unless some Commodities are taken from other Countries by Way of Barter in the Course of Trade, You can have but a
small Vent for your own Manufactures; it being impossible for any Nation to make all their Payments in Gold and Silver, even if they abounded with the richest Mines of those Metals. Nay, though it were possible, it may be greatly questioned, Whether it is not more for the Interest of a Manufacturing Nation to import sometimes raw Materials by way of providing for the future Industry of their People, than to be always importing Gold and Silver; which, when they come to be unconnected with Labour and Industry, (as in this Case they would soon be) have no other Effect, than to introduce Laziness, Vanity and Extravagance. And in the End Poverty.

"III. A third Proposition, by way of Preliminary, is this, That Cheapness in regard to Price, and Goodness in regard to Quality, are the Support and Prop of all Manufactures: And that it is impossible, in the Nature of Things, for a Nation to preserve any Manufacture, if they strike off, or suffer to be struck off, these two grand Pillars, Cheapness and Goodness. They may indeed tamper for a While; and seem to do something, not unlike a Quack in Physic, towards botching up a broken Constitution; but it will soon appear, that all they have been doing, was only to make bad worse."

Our eighteenth century manufacturers proceed to deal with the history of legislative interference with their trade from 1751, when "Application was made to Parliament for the Admission of Bar Iron Duty-
free from our own colonies." They set out how . . . "after various Struggles, as is always the Case, between Self Interest and the Public Good, the contending Parties seemed to compromise the Difference," and Bar Iron was to be imported Duty-free into London. The conditions and limitations of this permission were such that "in short as the Case stands at present, this Iron cannot be used in and about London and it shall not be permitted to be carried to those Places where it may be used. . . . The advocates of a free Trade were glad of getting even so far . . . hoping, that when the present Clamours had subsided, and Men's Minds became more opened and enlarged by . . . the natural Progress of Truth, a convenient Season might be found for making this particular Indulgence . . . become a general Benefit to the whole Kingdom."

The iron manufacturers next proceed to describe "the Persons concerned in the Iron Trade" who "are generally arranged into two Classes, The Iron MASTERS and the Iron MANUFACTURERS." The former, they say, are few in number, but must be "Men of Great Substance, great Capitals in Trade, and capable of exerting a very dangerous Influence when they find it their Interest to do so, over Men of needy Circumstances and small Capitals, dependent upon them." The Iron Manufacturers, on the other hand, "generally speaking and by way of Comparison with the former, are but of
middling Fortunes," but they add, "There is no sort of Comparison, in a National View, between the Importance of the one, and that of the other. And yet the whole Contest in this affair lies between these two sets of Men, The Iron-Masters on one side, and the Iron-Manufacturers on the other: Whereas besides all other Considerations, the Iron Manufacturers are to the Iron-Masters in Number, at least as Two Thousand to One."

The authors of the pamphlet next state eight "FACTS" in connection with the trade. (1) The iron manufacture is increasing. (2) The last application to Parliament has increased the price. (3) The trade in Swedish and Russian iron is in few hands, and may be made the subject of local duties in the country of production. (4) These Governments are already "stinting the making of Bar Iron within their respective Dominions." (5) Charcoal is rising in price. (6) American Bar Iron has some special qualities. (7) American Pig Iron, owing to the carriage on it and the cost of Charcoal, produces dear Bars. (8) The growth of the iron trade adds to the revenues of the Crown. "The Revenues of the Excise and Post-Office, in particular, have been doubled, trebled, quadrupled, and even sextupled, in the Counties of Stafford and Warwick, since the first settling of the Iron Manufacture in those Provinces." The writers next set out six "REASONS," to justify the "present Application to Parliament." I will not attempt to summarise these; let it suffice
that I should say they breathe the same spirit as the Facts. They are followed by the statement of five "Objections" and the "Answers" of the writers to these. I quote Objection III:—

“If the Americans are suffered to import their Iron Duty-free, all the English Furnaces and Forges must stand still: Because We cannot pretend to sell as cheap as they can: Our Woods likewise must be grubbed up; for it will not be worth the while to preserve them: And the Country, which is already too bare of Timber, will still be barer.” And since it refers to another commodity of which we hear a great deal in these days, I also quote the third answer to it:—

“Answer 3rd. Experience, which is the surest Guide, hath plainly shewn, that Self-Interest is a very unfit Judge of future Effects, and of the Consequences of Things of this Nature. The present Cry is, ‘That if Bar-Iron from America was to be admitted Duty-free, the Country would still grow barer of Timber, because it would not be worth while for the Land-Owners to suffer the Trees to grow.’ Suppose therefore that instead of Bar-Iron you had said Il’ool, and that an Out-cry was to be raised against the free Importation of Wool: ‘For, if Wool shall be admitted to come from other Countries, especially from Ireland Duty-free, Alack-a-day, what will become of Us? Our Sheep-Walks must all be destroyed; not a Flock, not a single Sheep will be left; because it will not answer to
rear or keep them: The Tenants must all break; the Landlords lose their Rents; and the Government its Taxes. These will be the consequences of admitting the Importation of Wool Duty-free.' Now, you must allow, that this Plea, were it made (and most probably it was made) at the Time, when it was debated, Whether it was right to admit foreign Wools Duty-free:—I say, that this Plea is at least as good and as reasonable as Yours. You must acknowledge likewise, that the Proprietors of Sheep Lands, and the Growers of Wool, are, in every Sense, a much more considerable Body of Men than the Iron Masters, and the Proprietors of a few Wood-Lands: And you must confess, because it is in vain to deny it, that there is a much greater Plausibility in the Argument for opposing the Importation of Wool from our Neighbours in Flanders, Germany, and Poland, especially from our next-door neighbours, the Irish, (in all which countries Land and Labour are much cheaper than in England) than it would be to oppose the Admission of Bar-Iron coming from so distant a Country as North America, where, if Land and Charcoal are cheaper, Labour, (the Principal Concern) is infinitely dearer. Yet, notwithstanding the Plausibility of the Objection, sure and long Experience hath made it to appear, that the Admission of Foreign Wool Duty-free, hath been so far from preventing the Growth of English Wool, that we have at this day more Sheep and more Wool, the Product of Great Britain, than ever
we had in former Times." The answer ends with the following sentence, which seems to be as true and as applicable to-day as it was a century and a half ago: "And if you are desirous of knowing the Reason of this Fact, it is plainly this,—The free Admission of Materials is the Cause of Labour; Labour is the Cause of Populousness; and a populous Country will always produce more Commodities, and have a readier Market for them, than if it had been thinner peopled."

I have dwelt at some length on this pamphlet, for it appears to me not only to contain the gist of all our present discussion, but to be in itself a more complete setting out of the case for protection in the iron trade and the arguments against it than I have found elsewhere in looking through the earlier records of the trade. It has, moreover, a further and larger interest. It shows once more the falsity of the allegation that Free Trade is a new doctrine invented some sixty years ago. All the arguments to which we are accustomed are to be found in the mouth of the Iron Manufacturers of 1756. Can any one doubt that the course of events was at that date tending more and more to the development of commercial freedom? It is a commonplace to call Pitt a Free Trader. His administration of the finances of the kingdom was marked by the sound principle that the object of a tax should be to obtain revenue with as little pressure on the taxpayer as possible and with a single
eye to that revenue and not to any other object. The outbreak of war with France in 1793 put a stop to all possibility of further progress in these directions. When peace was again established, a quarter of a century later, England groaned under a burden undertaken to preserve herself and Freedom from annihilation. All hope of dealing with financial reform on a large scale was postponed till she should have recovered from the terrible exertions and sacrifices of the past struggle. But before another quarter of a century had elapsed taxation had again become the burning question of the day. By the fourth decade of the nineteenth century the whole politics of the country were dominated by the question which, in 1846, found its solution in the repeal of the Corn Laws.

It is the policy of which that repeal was but the first-fruits which we are asked to reconsider. We are to impose taxes not for revenue, but to secure the goodwill of our fellow-subjects in the Colonies. We are to tie our hands from buying where we find it most convenient and profitable because the statesmen tell us that our trade will be benefited by going to this or that market for our goods. We are to run the risk of imperilling a prosperity such as I have indicated for the doubtful advantage of postponing a ruin of which we deny the imminence. We are called upon to imitate Germany, where the working classes are protesting to the best of their ability against that Brod Wucher (bread usury)
from which we escaped sixty years ago, or America, where Steel Trusts, with their shares at 80 per cent. discount, are to ruin our iron industry. America forsooth! Let me quote some passages from the letter of a private correspondent dated from California in August of this year (1903):

"After living in this country for seventeen years, under the domination of Protection, I think nothing worse could happen to Great Britain than that the people should be deluded into adopting such a policy. I verily believe that here every department in life, from Congress to State Legislature, from State Legislature to Municipality, from Municipality to Trade Union, and from Trade Union down to the newsboy at the street corner, is demoralised by the protective idea and by desire to get special advantages for classes or localities at the expense of the public.

"Of course you have recognised that in the outcry of 'American invasion' much that came from this side of the water was bluff and boast. For example, at the time the locomotive engine builders here were supposed to be doing so much in cutting into European and colonial trade they were six months behind in their home orders, and the railway companies here were so short of locomotive power that they could not haul freight in anything like a reasonable time. In consequence thousands of boxes of oranges rotted in transit or at the packing-houses where empty trucks were not forthcoming."
“From all accounts you have had great difficulties with your Trade Unions, but I very much doubt whether you have had to contend with anything approaching the arbitrary and domineering spirit that has been specially prevalent here during the last six or nine months more particularly. Nothing but the continuance of good harvests and high prices for grain prevents the trade unions from killing the goose.”

I dare not go on, for my correspondent launches into criticism of individuals which I do not feel justified in printing, though, so far as my knowledge goes, I entirely concur in them. If we are to imitate America, shall we follow her example in the treatment of her children in Southern cotton mills as described in the book recently published by Mrs. and Miss Van Vorst? 1

I myself see little or nothing that I wish to take from the Great Republic. I do not desire to have a crop of millionaires; I do not wish for a population striving for wealth at any cost; I do not value a political system which, unless all accounts are false, encourages and promotes corruption. I would rather see the iron trade of this country perish than purchase its prosperity on the terms which protectionists suggest.

What, then, is this trade of which we hear so much? I will not load my paper with figures

1 “The Woman who Toils.” By Mrs. John Van Vorst and Marie Van Vorst. (Grant Richards.)
THE IRON AND STEEL TRADE

which are accessible to all. The general results which I am about to state can be verified, by anyone who desires to check them, from public documents easily obtainable. The total value of the trade may be stated as amounting to between £150,000,000 and £160,000,000 a year. I include both the home trade and the imports of iron manufactures, which amount to about 10 per cent. of the whole. I regard every article made chiefly of iron as belonging to it. A needle and a ship may be taken as the extremes of the trade. It undergoes violent fluctuations from causes easily explained, which would, however, take up too much space to set out here. Subject to these fluctuations, it has been uniformly progressive during the half-century dealt with in the recently issued blue book on "British and Foreign Trade and Industry" (Cd 1761). I might go back much further than 1854, for, though its would-be protectors submitted it to the repeated torments to which I have already referred, it showed its vitality fully a century earlier. As knowledge increased, the processes were revolutionised again and again. The Catalan hearth, the blast furnace, the puddling furnace, the Bessemer converter, the open hearth furnace, represent successive changes in the conditions of the industry, each bringing great benefits to the consumer, but causing, for the moment, great disturbances to the trade. These disturbances have been met and turned to ultimate advantage by the indomitable
courage and perseverance of those engaged in the industry. Is it surprising that, with such a history, they shrink from a proposal to add the uncertainties of fiscal legislation to their existing difficulties?

When all is said, protection means that for some advantage to be gained to the community I shall be called upon to give up my right to buy where I please and compelled to buy where the Government wills. The State does not, and cannot, know my needs as I know them. Yet it asks to dictate to me how I shall satisfy them. I do not deny that, on cause shown, I should give up my freedom, but I do deny that any cause has been shown in the present case. What risks are being run? The home trade is worth at least £130,000,000 a year. It affords employment to over 1,000,000 men. The general head "Metals" in the census of 1901 gives 1,174,200 as the number of males over ten years employed in England and Wales, and iron is by far the most important metal. But it gives employment to thousands of men on the railways and to a very large proportion of the men engaged in mining. In the census returns, "Conveyance" stands for 1,249,200 and "Mines and Quarries" for 800,200. The only other headings in the census of England and Wales which exceed a million are "Agriculture," with 1,071,000, and "Building" with 1,042,000. "Textiles" employ 492,000 males over ten, but it is only right to add that 663,200 women and girls find employment in these industries, while "Dress"
employs 414,600 males and 710,900 females, and "Food, &c.," 774,300 males and 299,500 females. Giving full weight to all these figures, I think I am still entitled to claim for "Metals" the first place in the industries of the Kingdom. It is a serious matter to interfere with the well-being of so important a section of the community. It may be improved? Yes, but it may be worsened, and it will be difficult, in so complex a business, to say whether the improvement is caused by the change. "Dans le doute abstiens-toi" we say to our tariff reformer. If he persists, we ask what he proposes. Will he tax food? If he does, can it be doubted the price will rise? The recent development of the discussion appears to recognise this as incontestable, and I need not labour the point nor do more than refer to the significant figures on pp. 120–6 of the return already cited and the graphic representation of the figures in the chart which follows. If the price of the taxed article rises and wages rise, will the iron-master be better equipped for meeting the competition of the world? If wages do not rise, will his men regard the change with satisfaction? The interpretation put on some unguarded words of Sir H. Campbell-Bannerman's are, I believe, far from the truth. The majority of the labouring classes in this country cannot be regarded as on the verge of starvation. Fact after fact can be cited to show that this is not any way near the truth. But while I say this I do not deny that the position of
the artisan needs the most earnest care from the governors of the country. The future depends upon our ability to increase his efficiency. To place an impost on the necessaries on healthy existence is the last way to bring about this most desirable result.

Shall we tax raw materials? We must first determine what we mean by the term. Spanish ore is a raw material to some Cleveland ironmasters, but it competes directly with those who use Cleveland ironstone. Shall I and my associates, shareholders and workmen, who produce an all-British article, be put to a disadvantage as compared with those who import, in the form of ore, about twenty shillings worth of Spanish labour for every ton of iron they make? Pig iron from abroad competes with us both. Is my neighbour, who can obtain a contract by the purchase of, say, Canadian pig iron brought here because my Canadian fellow-taxpayer pays a bounty to the Canadian ironmaster, to forego his advantage and discharge his men? And so on through the whole list. Only the other day I was told of a man holding shares in two large undertakings in the north of England who was declaiming against "dumping." His interlocutor, a director of both companies, put to him this case: "I recently secured a contract for one of your companies from the other for a piece of work, and I was enabled to do it because I bought foreign steel cheap. You got a dividend
owing to the profit I made on the contract, and you were enabled to earn a dividend by means of the cheap apparatus I purchased. Do you feel inclined to give up both these profits?" I was given to understand that the answer was not suitable for publication.

I myself have bought electrical machinery abroad. It is hard to find a more highly finished product than a dynamo. To me it was an implement of production, practically a raw material. I used it to produce my finished article. Is it proposed to prevent me? I no longer need to go to Belgium for electrical machinery. British legislation had hampered electrical enterprise in this country to so great an extent that it was not the interest of the British manufacturer to embark on the trade. The difficulties are partially removed, and, at once, mobile and adventurous capital flows to this industry. This is an example of the danger of the interference of the legislature with trade, a danger which the present suggestions will increase rather than diminish.

Let it be borne in mind that the exports of the iron trade last year were valued at £60,000,000. As far as the discussion has gone these exports are to be encouraged. Will they be promoted by being made subject to any of the restrictions which are proposed? I guard myself against assuming that the time may not come when fiscal reformers will protest against such exports as the iron trade
provides. Coal has long been regarded as an article apart, requiring special treatment. But at least 70 per cent. of the value of coal is labour. If coal needs special treatment, so does iron. A ton of pig iron represents about two tons of coal, a ton of steel not far from twice as much. In both cases about 70 per cent. of the value is labour. Steel made from Cleveland pig iron robs the country of about four tons of ironstone and four tons of coal, both equally irreplaceable. If I am wrong to place the fuel in the hands of my competitor in the trade of the world, why not also the steel?

That this question is not idle may be gathered from Mr. Balfour's pamphlet on "Insular Free Trade." In the table appended to it, machinery is excluded from the value of British exports. No doubt, by dint of excluding first one and then another of our principal exports, it is possible to arrive at the conclusion that we have none of importance. This cannot be the reason why Mr. Balfour excludes machinery as well as coal. May it be found in the following considerations? In the golden age, now alas! long passed, Britain was the factory of the world. All important implements of production were to be bought from her. With a want of wisdom which we now deplore, she made haste to grow rich, and supplied to all comers the produce of her factories and workshops. Germany drew from her capital and machinery, and established important industries. Dazzled by her
own great and growing wealth, she failed to observe that the wretched Teuton, seeking some employment for himself, was embarking on industries which properly belonged to her, but which for the moment she was too busy to take up.

To America she sent rails by the thousands of tons and money to lay them down. The (I trust mythical) anecdote of the colloquy between an American railway magnate and a Welsh ironmaster is not so irrelevant as it may seem. They discussed the development of the American railways in the fifties. Said the ironmaster, speaking of the rails: "They were pretty poor stuff we sent you!" "Yes," said the railway magnate, "they were; but not worse than the bonds we gave you for them." Not only did America and Germany benefit by the Pactolian stream which flowed from Great Britain, every country was watered by the same fertilising flood. Short-sighted mortals! Had Mr. Balfour been with our ancestors he would have warned them of the fate they were preparing for themselves and us. They were in fact breeding up competitors who would ruin them. Each cargo of rails made it more certain that the mineral resources of America would become a danger to English trade. Had they been wise they would have said: "Nothing shall leave these shores which will add to the wealth or productivity of the world. A steam engine may be used to produce something we now produce, a rail may convey to the coast something we now send to
America." I do not know where to draw the line—
"a bale of piece goods may clothe a man, who, wretched being, will work and make something we now make." At every port would have been stationed a servant of the State to forbid the export of that which might in the future militate against the trade of the island. Insular Free Trade would have been a misnomer, for, as they feared to send anything out, they would have been unable to bring anything in, and the Trade of the country would have been Insular without being Free.

But the whole protectionist view depends on a radical misconception of the conditions of trade. In all the papers by fiscal reformers that I read, our imports appear to be treated as an irresistible flood which threatens to overwhelm us. No one seems to realise that they come here because those for whom they are destined have chosen to receive them. They were bought by men who saw their way to make a profit in the transaction. Let it be borne in mind that out of 528 millions sterling imported in 1902 over 440 millions were food and raw materials, and some 87 millions manufactures. We have seen how difficult it is to draw a clear line between raw materials and manufactured goods. Why should we suppose that the importer of Spanish ore is clever enough to make a profit, while the importer of a Belgian dynamo is going to lose by the transaction? If it could be shown that, blind to his own interest, he was losing, and that he and all the rest
of the importers were in like case, something might be said in favour of restraining him. But is there any proof of this? No sort of attempt has been made to minimise the startling figures relating to our prosperity and growing wealth. One last instance of it I cannot refrain from adducing. Men travel by railway for pleasure or profit. It is a sign of having at least the railway fare loose in one's pocket. What has happened with regard to railway travel? In the quinquennium 1855–9 the whole population travelled 4.8 times every year; twenty years later (1875–9) the whole population travelled 16.2 times every year; twenty years later again (1895–9) 25.5 times every year; and last year the whole population of nearly 42 millions travelled on the average more than 28 times by rail. There is no sign here of imminent ruin or impending starvation.

I think I have shown that the fears expressed for the trade are groundless, and that the remedy proposed is not only unavailing, but inapplicable. There remains only one matter with which I should like briefly to deal. How shall we account for and view the great development of industry in other lands, and notably in America and in Germany? I have, in passing, pointed out how largely we are responsible for both, and indicated how little reason I see to regret what was done in the past. It cannot have been difficult to foresee that as population increased in both countries fresh sources of employment would be sought. That Germany
with her population of 57 millions should aspire to a larger trade than Great Britain is not surprising; that the 121,377 square miles of these islands containing 42 millions of people should think to stand, in the matter of trade, permanently above the United States of America, with over 3½ million square miles of territory and upwards of 80 millions of inhabitants, only requires to be stated to be shown to be a futile imagination. That we should continue to be relatively the richest nation in the world is not so absurd. We have an active and energetic people desiring many things which cannot be produced at home, but which foreign nations show no reluctance to provide for us. We have an enormous power of spending, for we possess an income larger than almost any other body of men on the globe. That we can be forced to buy what we do not want, and compelled to use our capital resources for that purpose, I cannot be brought to believe. There is a long road to be travelled before the £18 to £20 of gross imports and exports per head of the population in this country is equalled by the £7 to £8 per head of Germany and France and the £5 to £6 per head of the United States. While these countries are adding to their wealth by their foreign trade we shall not be failing to do likewise. It may be difficult, or even impossible, to estimate the annual increment of the wealth of Great Britain, but the figures we possess point to a sum measured by hundreds of millions sterling. All these things con-
sidered, I look forward with every confidence to the financial future of these islands. There are only two provisos to this opinion. The first is that we should steadily refuse to let our statesmen tamper with our commerce; and the second, that we should neglect no means, by education, by legislation, by any other methods devisable by the wit of man, to make our people, of all classes, as efficient as their competitors in other countries.

I have not dealt with one side of the great question of the day; I mean the Imperial as contradistinguished from the Insular side. This is not because I undervalue its importance. On the contrary, I feel it would be difficult to put too high the sacrifices I am prepared to make to uphold that great free Empire which in my judgment embodies the highest ideal of government. But I am profoundly convinced that this ideal is not concerned with pounds, shillings, and pence. It does not depend on the cash nexus. It has its roots in no notions of material welfare, but in a great unselfish sentiment of co-operation towards larger and nobler ends which seek the establishment and maintenance of justice, of progress and of freedom.
THE MACHINERY AND ENGINEERING TRADES

By Arthur Wadham, A.I. Mech. E.

(Editor of the "Machinery Market")

It is impossible to deny the fact that the machinery and engineering industries have developed and prospered enormously during the last fifty years, i.e., during the "Free Trade Era," as we term it. The question which now engages attention is this: To what is the prosperity of the last half-century due? Is it a mere coincidence of the "Free Trade" movement; the natural result, that is to say, of increased inventive activity? Or is the advance in wealth and general comfort which has taken place attributable in a greater or less degree to the national policy inaugurated in 1846?

I leave to other and abler writers the task of dealing with the social aspects of this most important inquiry. The duty before me—which I undertake with a certain amount of pleasure—is to trace the
effect of our Free Trade system upon the great branch of commerce which forms the subject of this paper.

In order to do this with clearness it is necessary that the history of the machinery and engineering trades previous to the middle of last century should be glanced at, and the position they occupied at that time indicated with some amount of precision. We shall in this way secure a proper standpoint from which to compare past and present, and to pursue our investigations. The next step will be to examine the points at which the machinery and engineering trades came into contact with, and were influenced by, the operation of our Free Trade policy. I venture to think it will be apparent to every one who will carefully study the course of events, both immediately after the adoption of our present commercial system and since, that so far as the industry I am dealing with is concerned, its prosperity and constantly growing magnitude is largely due, both directly and indirectly, to the operation of "Free Trade."

**What do we Mean by "Free Trade"?**

It is a waste of time to discuss any question unless the terms we employ are clearly understood, and therefore the phrase must, if possible, be rescued from the vagueness and misapprehension which surrounds it. For instance, we are frequently told nowadays that our trade is "not free," or that
we are the victims of "one-sided free trade," because of the fact that we are hampered by the prohibitive or restrictive tariffs of other countries.

In order to grasp the meaning of the term "Free Trade" let us recall the principles upon which our trade legislation was based in earlier times. Probably no better corrective to misunderstanding in regard to this great question can be adopted than that of examining the conditions under which our commercial system was carried on previous to the middle of last century. I venture to predict readers will find themselves able, after such an inquiry, to form an unhesitating judgment as to the wisdom of the Fiscal Policy which this country has pursued during the last fifty years.

Prohibitions and Restrictions.

The antithesis of "Free Trade" is "prohibited or restricted trade." Our country has had experience of both systems, and this provides us with material upon which to form a sound judgment. Writing in 1783, Adam Smith records the practice of his day in a precise and vivid manner. After referring to the duty of more than 5s. per ton imposed on the exportation of coal, he says: "The exportation, however, of the Instruments of trade properly so called, is commonly restrained not by high duties, but by absolute prohibitions. Thus, by the 7th and 8th of William III., chap. 20, sect. 8, the exportation
of frames or engines for knitting gloves or stockings is prohibited under the penalty, not only of the forfeiture of such frames or engines so exported, or attempted to be exported, but of forty pounds, one half to the king, the other to the person who shall inform or sue for the same. In the same manner by the 14th George III., chap. 71, the exportation to foreign parts of any utensils made use of in the cotton, linen, woollen and silk manufactures, is prohibited under the penalty, not only of the forfeiture of such utensils, but of two hundred pounds, to be paid by the person who shall offend in this manner; and likewise of two hundred pounds, to be paid by the master of the ship who shall knowingly suffer such utensils to be loaded on board his ship.”

The motive of these and other regulations of a similar character, as Adam Smith pointed out, was “to extend our own manufactures, not by their own improvement, but by the depression of those of all our neighbours, and by putting an end as much as possible to the troublesome competition of such odious and disagreeable rivals.” To such an extreme was this policy pursued that it was made illegal under stringent penalties for “any artificer of any of the manufactures of Great Britain to go into any foreign parts in order to practice or teach his trade.” By the 23rd George II., chap 13, the penalty against any person enticing an artificer to go abroad for the

foregoing purpose was, "for the first offence, five hundred pounds, and to twelve months' imprisonment, and until the fine shall be paid; and for the second offence one thousand pounds, two years' imprisonment and until the fine shall be paid." The artificer himself who ventured abroad in contravention of this law was outlawed.

This system of mercantile law lasted a long time, and abundant opportunity was afforded to test and prove its value. Statutes prohibiting the exportation of all metals (excepting lead and tin) can be traced as far back as the reigns of Edward III., Henry VIII., and Edward VI. The result of the nation's experience of these restrictions was not satisfactory, for we find that modifications of these laws were made from time to time. Sometimes these changes were reactionary, but on the whole the tendency was in the direction of Free Trade.

**Trade Restrictions Abolished.**

Finally, in August, 1843, a clean sweep was made, all prohibitions on the export of machinery being thenceforward removed by the Customs Duty Bill, 6 and 7 Victoria, cap. 84. The administration of this law had previously been relaxed, for although between the years 1825 and 1843 the exportation of many kinds of machinery was still prohibited, it was left to the Board of Trade to use its discretion, each individual application from any person desirous of

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1 See "Porter's Progress of the Nations."
shipping machinery being considered on its own merits.

Three years later, viz., on June 26, 1846, the Corn Importation Bill (introduced by Sir Robert Peel) granting a free trade in corn, received the royal assent. By this Act the duty on wheat was reduced to 4s. when imported at or above 53s., until February 1, 1849, after which day the duty became 1s. per quarter only on all kinds of grain imported into the United Kingdom at any price.

This was followed in 1849 by another measure of equal, if not greater, importance to the industries of the country, viz., the repeal of the Navigation Laws. This Act, which was passed after much opposition, came into operation on January 1, 1850. Trade was henceforth "free," so far as our own country was concerned, and the true significance of the term is apparent. From that time the nation started on a fresh career, released from the narrowing and artificial bonds which hitherto had retarded its commercial progress.

Before passing on I must briefly mention the conditions under which the shipping trade was carried on previous to the Act of 1849. Under prior maritime laws the importation and exportation of goods from or to Asia, Africa, or America was restricted to English ships, of which the master and three-fourths of the mariners were to be English. Other countries retaliated, with the result that, until a reciprocal treaty was made with the United
States, British ships had to sail in ballast to America when they went there to get a cargo, while American ships came to Great Britain in ballast when they wanted a British cargo. The consumer in both countries accordingly paid double freight. Our merchants also laboured under the disability of having to pay whatever freight was demanded by a limited number of shipowners and trade was checked in consequence.

It is significant that these early restrictive Acts were all introduced under the title "An Act for the encouragement and increase of Shipping and Navigation," but the credit of having brought about the result aimed at must be given to the open-handed policy pursued since 1849. British shipping has increased from a tonnage of 3,360,935 in 1851, employing 141,937 men, to 9,524,496, employing 247,973 men. From the remarks of a writer on the shipping industry in a book published in 1851, it appears that the repeal of the Navigation Laws had an immediate beneficial effect.

"The recent change," he says, "in the Navigation Laws is producing important results in the commerce of England with foreign nations." British shipping," it is added, "has already derived great advantages from these enactments. There seems every probability that as British shipping is now fairly brought into competition with foreign, great

1 Knight's "Cyclopædia of the Industry of all Nations."
improvements will be made in shipbuilding; indeed, such improvements have already commenced."

We shall see presently that this had a very important bearing on the future of machinery and engineering.

**Why the Protectionist System was Abolished.**

It is said that the terrible experiences of the Irish famine and the helplessness of the country to deal with it owing to the inadequacy of our food supply, provided the final argument which induced Sir Robert Peel to amend the Corn Laws. But forces had been at work for a quarter of a century gradually, though surely, tending towards the emancipation of trade from the antiquated methods and barriers which cramped it.

The growth of population in the United Kingdom from less than 17,000,000 in 1801 to more than 27,000,000 in 1841 had altered the conditions of the country. Manufacturing operations had absorbed the energies of a large proportion of the people, and the agricultural resources of these islands being insufficient for the needs of the country, our food supply had, as a matter of sheer necessity, to be supplemented from other sources.

"Should these food supplies be admitted duty free, or should they be taxed?" This was the debatable question then, as it is now, with this difference, that whereas sixty years ago the object of the food protectionists was to maintain prices for
the benefit of the agricultural industry in these islands, the avowed purpose at the present time is to do so for the advantage of Colonial growers. The manufacturing and shipping trades had already attained a preponderance in the country’s interests, and if they were to be successfully carried on in face of foreign competition, it was essential that all raw material, and food more especially—as the raw material of labour—should be purchasable at the lowest possible price. Dear food hampers manufacture, checks trade, and causes want. It had brought about those results at the time of Queen Victoria’s accession to the throne, and the argument in favour of cheap food ultimately won the day.

The inauguration and rapid development of the Penny Post and of intercommunication generally, the power of the Press and interchange of ideas which had been rendered possible by the agency of steam and machinery, were powerful factors in winning the contest.

The issue was vast. The decision meant that the future of Great Britain was to be that of a great manufacturing and shipping nation, with world-wide connections, instead of one which must, sooner or later, find its limits within its own narrow boundaries.

It is conceivable that this country might have been able to supply its own food requirements fifty years ago if it had possessed the ingenious and powerful machines for ploughing, tilling, and reap-
ing available now; if also a better system of agriculture had been in vogue; and had land laws been in existence encouraging the cultivation of the soil to its full capacity. Those conditions, however, did not obtain; consequently we were compelled to pay other countries to do work for us which might have been done at home.

Whatever else may be done or left undone at the present time, our wise course lies in remedying now the deficiencies and mistakes of the past which remain unrectified. It is undeniably true that the more we can grow at competitive prices within our own shores the more profitable our trade will be. The produce of the soil and the efficiency of labour together form the primary source of all wealth. It is because the United States of America possess a superabundance of natural products that the fiscal problem in that country is of a different character to our own.

**Effect of Free Trade.**

I now come more closely into touch with my own portion of the subject. Foreign trade being thrown open without let or hindrance, an active exchange of our manufactures took place in return for the corn and food products bought by us from abroad.

The machinery and engineering trades of the country were amongst the first to profit by the change. The increase in the carrying trade, both by land and
sea, entailed in bringing larger supplies of corn to the English market from abroad,‡ provided additional work for railways and shipping, and as a consequence a growing demand sprang up for locomotives, marine engines, and all the mechanical paraphernalia needed for the handling and conveyance of merchandise. This in turn gave birth to subsidiary manufacturing trades, and stimulated existing businesses into greater activity. The employment of steam power and machinery thus rapidly increased, and, like a snowball, the volume of trade grew bigger at every turn.

Implements and mechanical appliances were needed by foreign nations for cultivating, harvesting, and transporting the greater quantities of food and raw materials produced to supply our requirements. An export trade in machinery followed as

‡ The quantities of wheat and wheat flour imported into Great Britain between the years 1825 and 1849 varied from 66,905 quarters to 4,835,280, or as other statistics give it, the average from 1829 to 1849 was 1,771,067 quarters annually, out of which Prussia supplied 435,791, United States of America 242,094, Germany 232,034, and Russia 209,237 quarters. It is interesting to observe that in 1849 the chief sources of our wheat and wheat flour supply were from the following countries (quantities stated in round numbers):—

<table>
<thead>
<tr>
<th>Country</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>750,000</td>
</tr>
<tr>
<td>United States of America</td>
<td>600,000</td>
</tr>
<tr>
<td>Russia</td>
<td>600,000</td>
</tr>
</tbody>
</table>

The gross total of all kinds of grain and meal imported in 1849 was 10,753,755 quarters, which included about 6,000,000 quarters of barley, oats, Indian corn, beans, and meal. This trade has been one of continued growth, our imports for 1907 being about four-and-a-half times greater than fifty years ago.
a matter of course, although it may be remarked that its growth was slow at first, as will be seen from the figures I shall presently quote. The substitution of machinery for hand labour has always required time, owing to the conservative attachment of human nature to old customs.

The prosperity of our machinery and engineering trades received an enormous impetus in other ways, owing to the increased import of grain. For instance, we may reckon that every additional thousand quarters imported, provided cargo for another vessel of the average tonnage of the time. The demand for additional steamships and their machinery, cranes and lifting tackle, plant for haulage, and so on, all brought in orders to engineering shops. The deepening and enlargement of harbours to cope with the increasing traffic, and the extension of travel for business and pleasure purposes which followed, also brought fresh business to the machinery trades. It may be added that similar influences are still continually at work.

**Exports of Machinery.**

Our export trade in machinery (to which reference has just been made) shows an enormous ratio of increase during the last fifty years. In 1850, when this branch began to assume substantial proportions, the declared value of our export trade classified under the heading of "Machinery and Millwork" was a little over one million pounds
BRITISH INDUSTRIES

sterling. Last year (1902) the returns were roughly 19 millions. I give the figures at intervals of ten years as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1850</td>
<td>£1,042,000</td>
</tr>
<tr>
<td>1860</td>
<td>£1,231,000</td>
</tr>
<tr>
<td>1870</td>
<td>£5,966,000</td>
</tr>
<tr>
<td>1880</td>
<td>£9,264,000</td>
</tr>
<tr>
<td>1890</td>
<td>£16,413,000</td>
</tr>
<tr>
<td>1900</td>
<td>£19,622,000</td>
</tr>
</tbody>
</table>

These figures represent the value sent out of the United Kingdom of locomotives and other steam engines; gas and oil motors; agricultural, mining, and textile machinery; sewing machines; and general machinery not specially designated. " Implements and Tools" come under another classification in the official returns, and are not included in these amounts.

The comparison of cash values is faulty as a measure of the relative magnitude of this department of trade at the beginning and end of the period under survey. For instance, it may be reckoned that the exports of 1850 would not exceed £250,000 in value if turned out under present-day systems of production. But ignoring this factor in the account, the volume of our machinery exports shows an increase of more than eighteen times in cash value during Free Trade times.

The following figures for 1902 show where we find our customers for these exports:

<table>
<thead>
<tr>
<th>Country</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign countries</td>
<td>£12,652,000</td>
</tr>
<tr>
<td>British East India</td>
<td>£2,933,000</td>
</tr>
<tr>
<td>British South Africa</td>
<td>£1,730,000</td>
</tr>
<tr>
<td>Australia and New Zealand</td>
<td>£1,437,000</td>
</tr>
<tr>
<td>Total</td>
<td>£18,752,000</td>
</tr>
</tbody>
</table>
THE AMOUNT IS LESS THAN IN 1900. THIS WILL PROBABLY BE ACCOUNTED FOR BY THE DISTURBANCE TO TRADE CAUSED BY THE WAR.

It will be seen that two-thirds of this trade is done with foreign countries, and it is exceedingly important to observe that if any considerable portion should be lost by the proposed change in our fiscal policy we cannot look to our Colonies for adequate compensation.

The next table shows the movement of this trade during the last two decades, the value of machinery exports to our Colonies and Dependencies being given first, and next those to foreign countries:

<table>
<thead>
<tr>
<th></th>
<th>1882</th>
<th>1892</th>
<th>1902</th>
</tr>
</thead>
<tbody>
<tr>
<td>British East Indies</td>
<td>£1,263,969</td>
<td>£1,954,409</td>
<td>£2,933,076</td>
</tr>
<tr>
<td>British South Africa</td>
<td>—</td>
<td>£443,396</td>
<td>£1,730,058</td>
</tr>
<tr>
<td>Australasia</td>
<td>£1,190,766</td>
<td>£888,315</td>
<td>£1,436,633</td>
</tr>
<tr>
<td>Canada</td>
<td>—</td>
<td>£139,059</td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>£2,454,735</td>
<td>£3,425,179</td>
<td>£6,099,767</td>
</tr>
<tr>
<td><strong>Foreign countries</strong></td>
<td>£9,507,925</td>
<td>£11,373,537</td>
<td>£12,652,045</td>
</tr>
<tr>
<td><strong>Grand totals</strong></td>
<td>£11,962,660</td>
<td>£14,798,716</td>
<td>£18,751,812</td>
</tr>
</tbody>
</table>

The exports to Canada have ceased to come into the amount as a separate item. Both there and in Australasia the policy is to make their own machinery as far as possible.

The increase shown in the exports to foreign countries is slow, but there is a decided advance in spite of the substantial defection of Germany and the United States as customers. The following will
give an idea of the fluctuations of this trade with the two last-named countries:

<table>
<thead>
<tr>
<th></th>
<th>1882</th>
<th>1892</th>
<th>1902</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.A.</td>
<td>£627,496</td>
<td>£1,051,856</td>
<td>£685,543</td>
</tr>
<tr>
<td>Germany</td>
<td>£1,354,850</td>
<td>£1,485,959</td>
<td>£68,025</td>
</tr>
</tbody>
</table>

In the course of the controversy now taking place it has been contended that we ought to eliminate the value of our machinery exports entirely from computations of the foreign trade of the country on the ground that they are the reverse of profitable. Machinery (together with coals and ships) has been described in this connection as "pernicious." The reason advanced for this dictum is that it stimulates the competition of rivals. If it be right to regard our machinery exports as a means of destroying our country's commerce, obviously the proper course to adopt is to revive without delay the old statutes abolished sixty years ago (referred to in the early portion of this paper), and once more to prohibit them absolutely. Before taking so reactionary a step it will surely be worth while, however, to inquire what substance there is in the argument. If the distinguished author referred to had examined the point more thoroughly before

1 These are the only figures given in last year's returns in which Germany is specifically mentioned. The entry represents the value of steam engines only exported to that country. Other exports to Germany are included under the general heading, "Countries in Europe."

committing himself so far as he has done, I am convinced he would have adopted an absolutely contrary view. Speaking broadly, it can be stated as an antithetical proposition that our exports of machinery have created the great bulk of our foreign commerce, and are of far greater intrinsic value to the nation than their immediate cash equivalent. In order to justify this statement we need only adopt the simple plan of inquiring, "What are the machines exported; what is their destination and purpose?" By way of example it will be found that last year we sent abroad to various countries locomotives to the value of £2,284,094. These locomotives are employed in hauling traffic on railways abroad. Another large portion of our machinery exports consists of railway plant, or machinery used either in the construction or for the equipment of railways. But since railways open up trade, by bringing buyers hitherto inaccessible to us into contact with our markets, none of these locomotives or machines can be denounced as "pernicious exports." Take another class, namely, machinery for the construction of docks, harbours, and irrigation works. The country has lately congratulated itself upon having brought a large tract of land within the area of cultivation in the fertile portion of the Nile valley by the construction of the Assouan dam. The machinery sent to Egypt for excavating, lifting, and carrying the material, as well as that for the sluices and other mechanical
appliances required to work the dam, and without which that magnificent work could not have been accomplished, were all part and parcel of the so-called "pernicious" exports. Again, amongst the machinery we send abroad are large quantities used in sugar and cotton plantations, the purpose of which is to cheapen the production of the raw material. Oil-mill machinery, agricultural implements, and many other appliances, serve similar ends. What would happen to our sugar, cotton, and oil trades if we might not send this machinery out of the country? How would the gold-mining industry of South Africa fare if it were deprived of the machinery we have sent abroad for its use?

The great trade in frozen meat and provisions also, which has been so profitable both to the Colonies and ourselves, owes its origin and maintenance to the exportation of refrigerating machinery. Almost the whole range of commerce could be reviewed on similar lines, but I have surely said enough to satisfy any inquiring mind that the machinery we export not only provides profitable work in constructing it for a large number of British engineering factories, but brings back, as the result of its use abroad, a great wealth of trade into this country. The question of textile machinery admits of some qualification, and this is probably what Mr. Balfour had in mind. Even there, however, if space permitted, a case could be presented in favour of these exports.
THE MACHINERY AND ENGINEERING TRADES
BEFORE AND AFTER FREE TRADE TIMES.

It is perfectly true that the locomotive and the marine engine were brought into existence before the advent of Free Trade, and their united agency has undoubtedly been the greatest factor of modern times in developing the commerce of the world. But there is something more to be said.

It is contended by some that our prosperity (outside that from our great national asset represented by our coal resources) was entirely made “in the early nineteenth century by the products of British inventions applied to textile manufacture, principally cotton, and in the middle of the nineteenth century by the further products of British invention (engineering and metallurgical) principally applied to the manufacture of iron and steel.”

The writer whose remarks I have just quoted, and those who take a similar view, miss an important point. They overlook the great impetus which was given to the industries of the country by the widening of our markets and the increased foreign traffic which, as I have already pointed out, took place as a direct result of the Free Trade system. Locomotives and steamships are of little use unless there is interchange of trade, and a policy of restriction curtails their value. The truth, as regards this part of the controversy, appears to be

¹ Letter to editor of London daily paper, August 14, 1903.
that the removal of commercial restrictions greatly stimulated the machinery and engineering trades (and other industries at the same time), but on the other hand the benefits of Free Trade could not have been realised without machinery and the inventions of the engineer.

Glancing at the history of these trades, before and after Free Trade times, we shall be able to see how these two great influences, the one political and the other mechanical, acted and reacted one on the other, and together built up the national prosperity.

The machinery and engineering trades may be said to date their commencement as a separate industry from the birth of the railway system and of the steamboat service, which events happened almost simultaneously. The fortunes of these three branches of industry are interdependent, and the growth of the machinery trade can be most effectively traced by following the development of railways and steamships. In the early part of last century the construction of machinery was noticeable for its strength and substantiality, but in other respects it can only be described as blacksmith’s work. An inspection of the wheels and other parts of the valuable relic—“Locomotion No. 1”—for instance, affords interesting suggestions of the rough-and-ready means employed by the mechanics of those days. As the demand grew, and educated minds gave their attention to this branch of work, improvements rapidly multiplied, and by the time
of the great Exhibition of 1851 the construction of machinery had become established on scientific lines.

Railway engineering.—The first great event in the history of this branch of engineering was the opening of the Stockton and Darlington line, which took place in September, 1825, i.e., twenty-one years prior to the repeal of the Corn Laws. This was the first railway in the world to convey passenger traffic. The success of that line attracted the attention of commercial men, and the further success which followed the opening of the Liverpool and Manchester Railway in 1830 formed the prelude to a rapid extension of the new means of transit. Evidence of the progress made by the machinery trade may be gathered from a record of the time, which mentions that at the ceremony of opening the latter line on September 15, 1830, eight locomotive engines made by Messrs. Stephenson at Newcastle started in succession drawing 28 carriages, capable of carrying about 600 passengers. On the following day one of the engines drew 130 passengers the 31 miles from Liverpool to Manchester in 1 hour and 50 minutes, showing that an excellent standard of workmanship and design had been attained. The excitement induced by these accomplishments and the possibilities of money-making opened up thereby led to a great deal of premature speculation, eventuating in what is known as the "railway mania" of 1835–7. To correct this, certain restrictions were introduced in the parliamentary
session of 1837 to check the facility of obtaining Railway Acts. Owing to this, and to the fact that so many people had "burnt their fingers" by immature investments, only five new lines were produced in the years 1838 and 1839. During the three years 1835-7, Acts had been passed for no less than 50 new lines, aggregating upwards of 1,600 miles.

A fresh outburst of speculative activity occurred in 1844. Parliamentary sanction was obtained in that year for 26 new railways or extensions of existing lines, totalling 797 miles and involving a total capital of nearly £15,000,000. At the end of 1850, 6,621 miles of railway line had been constructed in the United Kingdom.

The recital of these brief historical reminiscences enables the position of affairs to be indicated so far as our railway system was concerned at the beginning of the Free Trade Era. Is there any room to question its prosperity since that time? The mileage in the United Kingdom is treble that of 50 years earlier, and the capital paid up has grown from £240,270,745 in 1850 to £1,176,001,890 in 1900. The following comparative figures will assist in making the point clear:

<table>
<thead>
<tr>
<th></th>
<th>1850.¹</th>
<th></th>
<th>1901.²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miles</td>
<td>Average Receipts per Mile</td>
<td>No. of Passengers</td>
<td>Total Traffic Receipts</td>
</tr>
<tr>
<td>Open.</td>
<td>6,621</td>
<td>£2,328</td>
<td>66,840,175</td>
</tr>
<tr>
<td>22,078</td>
<td>£4,511</td>
<td>1,174,275,036</td>
<td>£99,595,434</td>
</tr>
</tbody>
</table>

The number of persons employed in working the railways of the United Kingdom in 1901 was 575,834. The extent to which railways give direct employment to the machinery and engineering trades may be realised by glancing at the following statement of rolling stock in use at the close of 1901, namely:

21,714 locomotive engines;
48,851 passengers' conveyances;
19,665 other vehicles attached to passenger trains;
697,683 waggons for goods traffic;
18,407 miscellaneous vehicles.

These figures speak for themselves. Indirectly, the machinery and engineering trades profit in many other ways from railway enterprise. This is obvious when it is considered how much money is spent in the purchase, not only of rolling stock, but also of bridge-work, rails, and engineering plant of almost every description for excavation, lifting, pumping, building, and so on.

*Marine engineering.*—For the beginnings of this we have to turn back to the year 1813, when a little boat named the *Comet*, of about twenty-five tons, and worked by a 3-horse-power engine, was started on the Firth of Clyde by Mr. Henry Bell. This was the first steamboat for passenger traffic permanently established in British waters. In 1818 Mr. David Napier directed his attention to the improvement of steam navigation, and we are indebted to him for introducing
steam-vessels for deep-sea communication and for the establishment of post-office steam-packets. Amongst early historical vessels was the *Rob Roy*, which plied between Greenock and Belfast, about ninety tons burden, fitted with engines of 30 horse-power, built in 1818 by Mr. William Denny, of Dumbarton. The s.s. *Talbot* (120 tons) followed, built by Mr. Wood for Mr. Napier, and fitted with two of Napier’s engines, each of 30 horse-power. This was the first steam vessel that plied between Holyhead and Dublin. A line of steamships was established about the same time between Liverpool, Greenock, and Glasgow. Advances continued to be made, and in 1838 the s.s. *Sirius* and s.s. *Great Western* made their successful passages across the Atlantic. The former completed the voyage from Cork to New York in nineteen days (April 4th to April 23rd), and the latter from Bristol to New York in fifteen days (April 8th to April 23rd). It is interesting to find that the s.s. *Great Western* made seventy voyages across the Atlantic, covering a total of 256,000 miles. The average speed on the outward journeys was 9½ miles, and on the homeward 11¾ miles per hour. Her shortest outward passage was 12 days 18 hours, and the longest (in stormy weather) 22 days 6 hours. The greatest number of passengers taken at once was 152.

Results which an industrial writer in 1845 described as “mighty exploits” we now look back
upon as mere preliminaries. The figures which follow will indicate the developments which have taken place in this department during Free Trade times.

The steamships registered at all the ports in the United Kingdom on December 31, 1850 (according to Knight's "Cyclopædia," published in 1851) were:

<table>
<thead>
<tr>
<th>Vessels.</th>
<th>Tons.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steamships under 50 tons ... 520</td>
<td>12,885</td>
</tr>
<tr>
<td>, 50 tons and above 658</td>
<td>154,327</td>
</tr>
<tr>
<td>Totals 1,178</td>
<td>167,212</td>
</tr>
</tbody>
</table>

"Lloyds' Register of British and Foreign Shipping" for 1902–3 gives the following recent figures:

<table>
<thead>
<tr>
<th>Vessels.</th>
<th>Gross Tons.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steamships 100 tons and upwards ... 7,358</td>
<td>12,897,592</td>
</tr>
</tbody>
</table>

The total tonnage of both sailing and steam vessels has increased during Free Trade times from 3,360,935 to 14,431,672. (The latter figures do not include shipping owned by the Colonies.) Our gross tonnage was greater in 1902 than ever before, and 53 per cent. of the world's steam tonnage is owned by Great Britain, notwithstanding the strenuous efforts of Germany and other nations to rival us. It need only be added that the marine engineering branch of our machinery industries has prospered in a similar ratio.
Progress of Invention.—The progress of invention is to a certain extent outside political influences (the operation of the patent laws always excepted, and I shall have something to say on this subject later on), but it deserves to be pointed out that the system of world-wide commerce directly resulting from the fiscal policy adopted fifty years ago, has provided engineers and inventors with an enlarged experience without which they could not have achieved an equal amount of success. It will consequently be fair to admit that the Free Trade system has had a material influence on the progress of invention.

The last fifty years have witnessed the following amongst other advances in marine engineering and shipbuilding practice: The substitution of iron for the hulls of vessels instead of wood—the s.s. Persia in 1856 was the first Cunard iron paddle steamer—and the displacement of iron by steel, the first ocean steamer to be so built being the s.s. Rotomohana in 1879. Screws have almost entirely superseded paddles for propulsion, and twin screws, which were first used on an ocean express in 1888, are now very frequently adopted. The invention of steam steering gear has rendered the management of the vessels easy and has enabled the size to be increased almost without limit. Great relative economies in fuel consumption have been effected by the introduction of compound, triple, quadruple, or even quintuple cylinder condensing
engines. These and other improvements in engine and boiler construction have enabled power to be obtained from modern machinery at the approximate rate of one indicated horse-power for each pound of coal burnt. In 1838 the consumption was 6\(\frac{1}{2}\) lbs. for each horse-power per hour.\(^1\) A striking result of this inventive progress is that whereas the average freight on corn imported into this country was 6s. 5d. per quarter in 1872, it was made possible to reduce this to 3s. 6d. per quarter in 1900. The turbine engine now coming into use for large vessels, and which has given a speed of 36.581 knots, or nearly 42 statute miles an hour on torpedo craft, and the water-tube boiler for marine use, mark the latest phases of development in our marine engineering practice.

**Present Position.**

The latest Official Returns issued by the Chief Inspector of Factories and Workshops (Supplement to Annual Report for 1900 Cd 841) state that 404,412 persons were employed in factories manufacturing machines, engines, and electrical engineering appliances. Compared with the Returns for 1897 (three years previously) this shows an increase of 16,318 persons. Obviously the machinery trade is growing. The official returns of our machinery exports already quoted, bear further testimony to

\(^1\) "Steamships and their Machinery," by J. W. C. Haldane, p. 375.
this, allowing for fluctuations of a special or temporary character. On a careful reckoning I suppose that the number of persons employed in the machinery and engineering industry fifty years ago would be somewhere about 20,000. From this it would appear that under Free Trade conditions employment has been provided for twenty times the number of workers in this branch of trade.

In discussing any suggestions for changing our fiscal policy, it is a matter of grave national concern that the probable effect upon the machinery and engineering trades and upon the large section of our population dependent on them should have special consideration. They rank as the greatest of our manufacturing industries at the present time. Their productions are unquestionably the most important because every department of commerce is dependent nowadays upon machinery for its existence. Wage-earners are more extensively interested in the prosperity of these trades than any other, the textile industries not even excepted. For whilst in 1890 there were 1,036,570 hands employed in the whole of the textile trades of the United Kingdom (cotton, woollen, silk, shoddy, flax, &c.), of these only 290,797 were "males above 18 years of age," the remainder being women and children. In the section of the machinery and engineering trades, which finds employment for the 404,000 hands referred to above, 342,000 were "males above 18 years of age," and they represent the most highly