Germany and Austria before the war, and practically the whole of the hollow-blown furnace-made glassware was obtained from these countries. It is almost equally true that the entire lamp-blown scientific glassware was obtained from foreign countries, although there existed in this country a small number of highly skilled workers at the blow-lamp flame who produced the unrivalled English clinical thermometer and a limited number of types of chemical thermometers. In addition to these workers, there was a number of lamp workers who repaired damaged foreign glass apparatus, produced special lamp-blown glass apparatus, and tidied over the difficulties of importers awaiting shipment of foreign-made glassware. These highly skilled glass workers could almost be counted on the fingers and belonged to the industrial class covered by the term "out-workers," whose premises were unpretentious and whose capital and apparatus were limited to a few pounds and a blow-lamp. It was fortunate that the dealers in laboratory glassware had large stocks when war broke out; otherwise the production of munitions would probably have come to a very sharp end, and it was soon apparent to those familiar with this industry that should the war be a long one the situation would become exceedingly critical. Steps were taken to produce scientific glassware in this country, but this was an exceedingly difficult task, for though it was possible for the chemist to analyse glassware and evolve formulae, the commercial manufacture of the glass presented enormous technical difficulties. With no previous experience of this industry to guide them except that of the domestic glassware and the bottle industry, our glass manufacturers tackled the problems. In their endeavours they met with reverse after reverse, for, apart from a lack of knowledge, inadequate materials and glasshouse equipment, there was no British labour trained to blow the light hollow ware required in laboratories. Stocks rapidly diminished, manufacturers were pressed for their production, and British-made scientific glassware was placed on the market in a condition which was as unsatisfactory to the manufacturers as to the users, and could only be termed "stop-gap." Steadily, however, and at the cost of great monetary loss, the production of scientific glassware was improved, and to-day our manufacturers are producing light hollow-blown scientific glassware which is superior in resistance to chemical reagents, and general utility, to that produced in any other country.

The lamp-blown section of the industry is dependent upon an adequate supply of glass tubing, and before the war there were few skilled tube-drawers in this country, and although efforts were made to train workers, this was an undertaking requiring time, for the operation is one requiring great physical endurance and manipulative skill; and in spite of exceedingly high wages, even at the close of the war the number of skilled tube-drawers in this country was lamentably small.

The skill required of the operator who manufactures a lamp-blown article from tubing varies from that required to make a simple article, such as an ampoule, to that required for making a high-grade thermometer or X-ray tube, and it was therefore possible to increase rapidly the number of workers engaged in the simpler operations; but the high degree of skill required, together with the demands of the recruiting authorities, prevented any large increase in the numbers of the highly skilled workers. Yet on this weak section of the industry, struggling against innumerable difficulties due to lack of adequate glass tubing, lack of manufacturing plant and lack of skilled labour, was thrown at one critical period of the war a responsibility in connexion with our anti-submarine campaign on the satisfactory discharge of which our national

safety depended; and the glass-tube drawers and lamp-workers did not fail.

The demand for scientific glassware in the future will exceed that in the past, for it is obvious that the industrial progress and health of a community is becoming increasingly dependent upon its laboratories. Our Empire cannot afford to allow its industries, its health, and its safety in time of war to be dependent upon a commodity, the manufacture of which is controlled by a foreign nation.

We are, however, swiftly drifting into that position, for, owing to the difficulties experienced by manufacturers in developing the scientific glass industry, the high costs of building and equipment, and the strength and reputation of the German and Austrian manufacturers, the industry was never in a position to stand unaided against continental competition, and the rate of exchange has now made the position, without protection, hopeless.

The Standing Committee on Trusts, in its interim report just issued, says:—"The manufacturers of scientific glassware have incurred considerable losses since they undertook to manufacture this class of glassware, and although we are not able to report as to the fairness or unfairness of past and present prices, we consider that such temporary support should be afforded to this new industry as is consistent with fairness to consumers. If this were done, probably within reasonable time the industry would be able both to hold its own against foreign competition and to sell its productions at prices acceptable to the public."

Unrestricted importation of scientific glassware, however, is to-day crushing the British industry, and some manufacturers have been forced to cease production, others have discharged labour trained at great expense in the time of the nation's need, and soon, unless help in the way of preventing unfair continental competition is given, the industry will pass to Germany and Austria, and once more the Empire will depend upon our late enemies for that production which is most essential to our industrial progress and national safety.

REPORT OF THE RAILWAY RATES ADVISORY COMMITTEE.

A. J. MALACRIDA.

(Transport Manager, Association of British
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The Railway Rates Advisory Committee after sitting in public for forty days has now presented to the Minister of Transport its report (Cmd. 1098, 9d.) on the principles which should govern the fixing of tolls, rates and charges for the carriage of merchandise by freight and passenger train and by other services. As the report is very comprehensive, consisting of 54 foolscap pages, it is not possible to consider all the important points it raises, but as many of the proposals are of vital importance to the chemical industry, it is essential that these should be treated at some length.

The two main principles advocated by the Committee in respect of the fixing of future rates are:—

(1) The charge must in no case be less than the cost to the railway company of rendering the required services.

(2) The charge must in no case be more than the value of the services to the trader.

This seems a very sound policy, especially so far as the chemical industry is concerned, because at the present time the rates which are charged for the conveyance of chemical commodities are out of all proportion to the cost to the railway companies and

to the value of the service to the trader. It is not necessary to labour this point because it has already been fully dealt with in the articles which have appeared in previous issues of this *Journal*, by Mr. J. Lukes, traffic manager to Messrs. Brotherton and Co., Ltd.

In regard to the component parts of the new rates, the report states that all parties seem to be agreed that the present system should be continued, i.e., there should be a rate for conveyance and separate rates for station accommodation and services rendered at the terminals at each end of the transit, and that owners of private sidings should only be charged for the services actually rendered to them, the proper rates being fixed for terminal charges at the same time as the conveyance rates. The Rates Advisory Committee recommends that a new tribunal should be set up to deal with the fixing of the rates, tolls and charges, and to the present writer this appears to be a great step forward, which should prove of much benefit to the trading community as a whole. At the present time the fixing of rates and charges is left entirely in the hands of the railway companies, so long as they do not exceed their maximum power and do not create undue preference in favour of one trader as against another. Apart from this the trader has no voice in the fixing of the rates and charges, and the recommendation now made should assist in the development of industry generally. To illustrate this one might instance many cases in which representations have been made to the railway companies that certain commodities could not bear the rates charged between particular points, and in which the companies have refused to grant reductions on the ground that although the traffic would not pass between the particular points in which a trader was interested, it would pass in other directions. In future, cases of this sort would be brought before the new tribunal, which would doubtless consider them from all points of view, and in all probability it would grant such rates as would enable traffic to move freely; and whilst perhaps the rate might be on a lower basis than the railways would usually approve, it might still be remunerative, having regard to the possibility of developing the industry and increasing the traffic put on the railways.

From the standpoint of the chemical industry, the most important feature of the suggested tribunal is that it would decide as to which articles are to be classed as "dangerous goods." The wording of the recommendation is perhaps not quite as clear as the industry would desire, yet it is thought that the suggestion is a great advance on the existing position. It is well known that at the present time the railway companies have absolute power under Section 105 of the Railway Clauses Consolidation Act, 1845, to specify which goods are dangerous, and this decision, if based on the *bona fide* judgment of the railways that the goods are dangerous, cannot be altered except by a repeal of the Statute. This is aptly illustrated in the case of *The Midland Railway and Others v. Messrs. Butler and Co. (Bristol), Ltd., and Messrs. Brotherton and Co., Ltd.*, in which the Railway and Canal Commissioners held that they could not alter the *bona fide* judgment of the railway company that certain goods were of a dangerous nature.

In addition to the new tribunal, the Rates Advisory Committee recommends that a body, to be called the Railway and Traders' Conference, should be set up to act as a Conciliation Board without coercive powers. The proposal is that in each of the great distributing centres of the country two panels should be set up, one consisting of representative traders, and the other of officials of the railway companies serving the district; and that from these panels a committee should be formed to which any

traders having a grievance might make application, and which would have power to make recommendations but not to make or enforce orders. If a question appeared to involve general principles or an issue of great importance, the local tribunal would be empowered to refer it to the Rates Fixing Tribunal. The object of these local tribunals is to secure a hearing for traders who, although admitting that the railway authorities will usually redress a grievance if it be properly presented to them, nevertheless contend that their complaints are too often disposed of in a rough and ready manner by minor officials without adequate consideration.

Maximum and Actual Rates.—The maximum charges for the conveyance of merchandise which the railway companies are entitled to make under the Rates and Charges Order Confirmation Acts, 1891-92, were really a necessity so long as the railways were allowed to determine the actual rate, but as the power to fix rates is in future to be in the hands of the new tribunal, the Rates Advisory Committee suggests that it should also be entrusted with the determination of maximum rates. This appears very reasonable, seeing that the new tribunal is to have the power of raising or lowering rates after full investigation.

Continuous Mileage.—Throughout the evidence given by the traders, a general desire was expressed that the new system of fixing rates should be on the principle of continuous mileage, and not upon the cumulative principle now in operation. The effect of the cumulative principle is that rates for a distance of, say, 100 miles, when computed over two lines of railway, are greater than those for 100 miles when the transit is on one line of railway only; and the Rates Advisory Committee considers this state of things to be a serious anomaly. The railway companies strongly opposed the principle of continuous mileage, although actually many of the rates which they charge at the present time are based upon it, as are also, generally speaking, the receipts for the conveyance of merchandise when divided between the various railways, no regard being paid to any advantage that may have accrued where the rates are made upon the cumulative principle. The Rates Advisory Committee therefore recommends that in the case of through rates the principle of continuous mileage be adopted with provisions in the case of different rates prevailing on the railways involved similar to those in regard to portions of the railway having different maxima under the Railway Rates and Charges Orders.

One of the most important features of the recommendation relating to continuous mileage is its application to short distance traffic and to the fixing of the minimum charge. The report states:—"We consider the anomaly of making two minimum charges as for six miles each of transit, for possibly a total distance of four or five miles, as more objectionable than that of different charges for long-distance hauls according to whether the transit is on one or more railways." With the adoption of continuous mileage, the Rates Advisory Committee does not intend to interfere with the existing regulations, but to allow bonus mileage to be charged in respect of the portions of the lines which have been constructed at extraordinary expense, such as Runcorn Bridge, Forth Bridge, Severn Tunnel and lines in and around London. It is intended that such bonuses should continue to be charged, and in general indicated by the total distance being treated as being increased by the stipulated extra mileage. In those cases where different maxima have been fixed in respect of certain portions of the same railway, the Committee thinks that these differences should not be continued, but that a single rate sufficient to provide the desired revenue should be fixed for each class of

goods upon the whole or each of the railways or groups.

Terminals and Disintegration of Rates.—Section 33, Sub-section 3, of the Railway and Canal Traffic Act, 1888, placed an obligation upon the railway companies to disintegrate rates when application is made by a trader, but the disintegrations which have been given by the companies in the past have been in such a form as to be practically useless to the trader asking for the information; and during the hearing the traders consistently urged that all rates in future should be disintegrated in such a manner as to show separately the difference between the amounts for conveyance and those for each of the services.

The railway companies are willing to concede that if standard rates and tariff are fixed by an independent authority, the rates and tariff so fixed should show the amounts to be charged for conveyance and for terminal accommodation and services separately, but they claim that there should be no obligation upon them to disintegrate exceptional rates or apportion any part of the charge to terminals. The Committee is of the opinion that there is "to some extent justice in the claims of the traders, but that the counter arguments of the railway companies ought not to be ignored," and it recommends that the conveyance rate and terminal charges should be separately specified in the standard rates to be fixed by the tribunal, and that when the tribunal is called upon to fix an exceptional rate it should specify how much of that rate is for conveyance and how much for each terminal.

In the main, the claims urged by the traders have been met in the recommendations of the Committee, and these will prove a great boon, especially to those traders whose works are connected with the railways by private sidings.

Services Rendered at or in connexion with Private Sidings.—The present position as regards private sidings is that the owner pays the conveyance rate, but is free from any general obligation to pay the terminal charges whether for station accommodation or services, but the Rates and Charges Order Confirmation Acts, 1891-92, provide that the railway companies may charge a reasonable sum for services rendered at or in connexion with traffic at sidings not belonging to the company, any difference arising under Section 5 of the Orders quoted to be determinable by an arbitrator appointed by the Board of Trade. In practice, however, the railways have made their charge for siding services the amount of the terminal charges that are included in the rate applicable to the nearest goods station. This may be the full statutory terminal charges or less, according to the amount of the rate charged.

Whilst the Rates Advisory Committee does not see any reason for altering this state of things, it recommends that the duty of determining any difference should be placed upon the new tribunal. With a view, however, to fixing the reasonable sum to be paid by the owner of a private siding during any period which may elapse before the question can be determined, either by an agreement or by a new tribunal, the Committee has framed a series of rules.

Other matters dealt with in the report are "Conditions Affecting Carriage by Rail," and the "Conveyance of Traffic at the Actual Gross Weight" (except in the case of timber).

The report, as a whole, is a very valuable document, and opens the way for a scheme whereby the railway rates of the future may be made very much simpler and therefore more helpful to all concerned. The traders have gained valuable concessions, which will doubtless be more appreciated as their effects come to be experienced.

CORRESPONDENCE.

RAIL CONVEYANCE OF CHEMICAL COMMODITIES.

SIR,—Mr. Lukes' article in the *Journal* of December 31 does not, I think, need a lengthy reply from me, and I would ask those who are interested in the subject to re-read my article in the *Journal* of November 15, and they can judge whether I succeeded in correcting the exaggerations in Mr. Lukes' first article, and whether he has now brought forward any new facts of material importance.

When Mr. Lukes asserts that the railway companies have the power to decide what goods are dangerous and the sum to be charged for their conveyance "whether their views be right or wrong," he exaggerates the facts. The law provides that the companies shall not exercise their powers unjustly, and their charges must be reasonable.

The quotation from the American Inter-State Commerce Commission Regulations appears to insinuate that the British railway companies have not conferred with manufacturers and shippers in regard to specifications and regulations for the packing and transport of dangerous goods, but Mr. Lukes knows that many such conferences have been held and amendments made as the result of such discussions. I do not know whether these conferences are compulsory in America, but I do know that the British railways are not compelled to hold such conferences, but have done so voluntarily.

In his reference to the test case heard before the Railway and Canal Commissioners, in the matter of the *North-Eastern Railway Co. v. Reckitt and Sons, Ltd.*, Mr. Lukes omits to mention that the presiding judge, Mr. Justice Bankes, stated in delivering his judgment:—"In my opinion, therefore, even if the test contended for by the defendants be applied, these goods are dangerous." Mr. Gathorne Hardy, although in some doubt, said:—"On the whole, especially having regard to the question of storing and warehousing, I cannot bring my mind to the conclusion that these are not dangerous goods." Sir James Woodhouse, although he held a different opinion, as stated by Mr. Lukes, made some very pertinent remarks which Mr. Lukes omits from his quotation. Sir James said, in reference to Section 105 of the Railway Clauses Act, 1845, and the companies' powers:—"They must of course exercise the discretion vested in them with absolutely good faith and not for the indirect purpose of obtaining charges which they could not otherwise obtain. There is no suggestion of their acting otherwise in this case." (The italics are mine.) Mr. Lukes complains of the arbitrary powers given to the railway companies, but he has not given a single instance in which the Court has decided that these powers have been used by the companies in an unfair and arbitrary manner.

I stated in my article that the rates charged for dangerous goods had not been generally raised as a consequence of their transference from the White to the Yellow pages. Mr. Lukes gives no instance to the contrary. He mentions trinitrotoluol; but this substance always has been classified as a dangerous article, and the change made has been to transfer it from the category of Dangerous Chemicals to the list of Explosives, consequent upon the issue of an Order-in-Council, No. 898 of 1917, which definitely included it in the Authorised List. The rates charged for its conveyance automatically became the same as those charged for all other explosives of the same class.

As regards "Spirits of Tar" and "Mineral Tar Oil," no rates were raised. In these cases, the traders claimed to declare their traffics under names which did not correctly describe them, in order to