THE SOCIETY'S MEETINGS IN FRANCE.*

ANOTHER step was taken in July towards linking up with our members and friends abroad as the result of the visit of a party of thirty odd members and their friends to France. The visit, planned and discussed nine months previously, met with complete success, reflecting a very happy and generous spirit in the hearts of all who took part and excellent organisation on the part of M. L. Delloye (Directeur-Général des Glaceries de St. Gobain, Chauny, and Cirey) and his colleagues in France, of Mons. V. Naudeau (the London representative of this firm), and of our Secretary at headquarters.

The main party journeyed from Victoria on Saturday morning, June 30th, 1923, by Newhaven-Dieppe to Paris, and the weather was so favourable that no sea memories were left but pleasant ones. Other members made their way by various routes, and ultimately in Paris there assembled the following British representatives :

J. S. & Mrs. Atkinson	Messrs. Stein & Atkinson, Ltd., London.
R. F. Bacon	Messrs. Wm. Cory & Son, Ltd., London.
D. Balmain	Messrs. G. Davidson & Co., Gateshead-on-Tyne.
G. E. Bateson	Messrs. Bateson Bros., Liverpool.
H. A. Bateson	Messrs. Bateson Bros., Liverpool.
L. M. Butterworth	Messrs. Butterworth Bros., Ltd., Manchester.
F. G. & Mrs. Clark	Messrs. Beatson, Clark & Co., Ltd., Rotherham.
J. Currie	Messrs. Scottish Central Glass Works, Ltd., Alloa.
S. English (Hon. Sec.)	The University, Sheffield.
C. L. Fraser	Messrs. G. Davidson & Co., Gateshead-on-Tyne.
W. G. Gass	Messrs. Entwisle & Gass, Ltd., Bolton.
W. A. Gordon	Messrs. Kilner Bros., Ltd., Conisboro'.
E. A. Hailwood	Messrs. Ackroyd & Best, Ltd., Leeds.
Col. S. C. Halse, C.M.G.	Messrs. J. Lumb & Co., Ltd., Castleford.
A. H. Jackson	Messrs. Dowlow Lime & Stone Co., Ltd., Buxton.
A. Luraschi	Messrs. A. Luraschi, London.
G. E. Noad	Messrs. J. Moncrieff, Ltd., Perth.

* In drawing up this account the Editor is much indebted to Mr. H. Townsend, the representative of *The Pottery Gazette* who accompanied the party.

W. F. Pearson	Messrs. S. Pearson (West Bromwich), Ltd., West Bromwich.
F. W. Preston	Messrs. Taylor, Taylor & Hobson, Ltd., Leicester.
E. D. J. Robertson	Messrs. J. Lumb & Co., Ltd., Castleford.
T. W. F. Robertson	Messrs Robertson & Russell, Sheffield.
W. S. Robinson	Messrs. Barr & Stroud, Ltd., Glasgow.
V. Stott	National Physical Laboratory, Teddington.
T. Teisen	Birmingham.
H. Townsend	*The Pottery Gazette*, Stoke-on-Trent.
Prof. W. E. S. Turner, (President)	The University, Sheffield.
W. W. Warren	Messrs. Lemington Glassworks, Ltd., Lemington-on-Tyne.
H. Webb	Messrs. T. Webb & Corbett, Ltd., Stourbridge.
F. & Mrs. Youldon	London.

At St. Lazare, a deputation of three, namely, Messieurs Dorsemaine and G. Roy, colleagues of M. Delloye—both of whom remained with the party throughout the week, giving assistance in every possible way in the various journeyings undertaken—and the Secretary of the Chambre Syndicale des Maîtres de Verreries de France, awaited the arrival of the train to offer a welcome to Paris. At dinner the same evening, at the St. James and D'Albany Hotel, we had the pleasure of meeting M. Delloye, a man of simple tastes and great personal charm, who had been responsible ultimately for the organisation of the arrangements in France. Thus the visit opened very happily.

The following day (Sunday) was spent as a free day in Paris and its environs, advantage being taken by the major portion of the party to spend the afternoon in the Palace and grounds of Versailles, which have been rendered all the more historic through the holding of the Peace Conference there and the signing of the 1919 Peace Treaty. Fortunately, it was the first Sunday of the month, and the fountains were playing—an impressive sight, which comparatively few foreign visitors have the opportunity of seeing, owing to the infrequency of the operation, due to the high cost that is entailed.

The Reception by the Chambre Syndicale de Maîtres de Verreries.

On Monday morning, July 2, a formal reception took place by the Chambre Syndicale de Maîtres de Verreries de France, at the offices of that body, 32, Rue de Paradis, which quarter, by the way, is the recognised centre of the glass and china wholesale showrooms of Paris.

An important body of glass manufacturers had assembled from

many parts of Northern France to welcome the English visitors, each of whom was gracefully received and introduced by M. Léon Houdaille, the president of the Syndicate, who subsequently voiced the following official welcome, which he began in the French language: "Ladies and gentlemen of the English delegation and gentlemen of my own country,—I am happy to greet here, in the name of my French confrères, the distinguished representatives of the Society of Glass Technology, who are to-day the guests of the Chambre Syndicale des Maîtres de Verreries de France. I greet equally the eminent savants whose scientific work renders daily such conspicuous service to the glassmaking industry. Their presence with us to-day is a precious testimony of the interest that they take in our beautiful craft. I also thank those members of our Syndicate who have assembled in these offices to celebrate the arrival in France of our English confrères, and in order to prove to them how welcome they are in this house of glassmakers. The Society of Glass Technology, which we receive here to-day, has its headquarters at the University of Sheffield, and some of its most eminent members are with us to-day. The English society also includes among its members a certain number of our own compatriots, including Prof. H. Le Chatelier, whom we are particularly pleased to see present at this gathering, and several French glass manufacturers, who are at the same time members of our Syndicate, amongst whom are to be counted Messieurs Delloye, Despret, Charbonneaux, Thouvenin, and others. And now, gentlemen, permit me to discard, for the time being, our mother tongue, in order that I may explain to our English confrères in their own language what our Syndicate represents—its organisation, the problems that it studies from the social, economic, and fiscal points of view—and to outline simultaneously the difficulties encountered by our industry by reason of the devastations of our enemies and the efforts of the industry to rehabilitate itself."

From this point, M. Houdaille continued his discourse in English. He said: "Ladies and gentlemen of the British Delegation,—You are welcome in this Syndicate house of glass-makers. This is the head office of our Syndicate—a vast organisation which includes nearly all the French master glass-manufacturers, who are grouped, according to the specialities of their productions, in six technical sections, each of which has its own president, and is an autonomous syndicate so far as concerns the particular products which it manufactures. The sections include bottles, mirrors, goblets of all sorts, crystals, flagons, and window panes. Moreover, a certain number of district groups operate in the bosom

of our main Syndicate, and are composed of manufacturers having common interests as regards labour, supplies, and so on.

"Such, gentlemen, is the general organisation of our association, which studies alike all the problems that are of interest to our industry, whether they be economic, social, or pertaining to Customs duties. The prosecution of these vast aims, although all general problems concerning industry have become very complicated since the war, does not prevent a keen research being made in order that we may embrace such scientific progress as is calculated to improve the technical part of our manufactures.

"After many years of peaceful and regular operation of our industry, which relied on manual labour for the greater part of its production, the glass industry has had to face the complicated problem of mechanical manufacturing, rendered necessary by the scarcity of a form of labour which formerly was plentiful and skilful, but in which the war has left great gaps, and prevented the recruiting of the younger elements. The law of supply and demand has rendered very exacting, as regards wages, all those who have not been attracted elsewhere by professions that are easier in appearance, and which do not demand such a long apprenticeship.

"Social conflicts have also added to the complexity of the situation. It is thus that the ringleaders of the workmen's syndicates found, in the particular situation which I have just communicated to you, a favourable ground for their deplorable propaganda, by which they have managed to draw their followers into frequent conflicts, which were not in the least justified by the position of the French glass workers, who are at present touching very high salaries, and who have seen constant improvements realised in their conditions of work, as, for example, the suppression of the night shifts in all the glass factories using glass melting pots. To this question of labour has been added the economic crisis from which all the European nations have suffered. Once the war was over, the various nations found most of the foreign markets closed to their exploitations. Certain sales disappeared almost completely, as was the case with our champagne bottle industry. The stoppage of the sale of champagne in the Oriental markets, in Russia, and, notably, in America, compelled some of our bottle manufacturers to keep their furnaces idle for several years.

"But, gentlemen, there is another cause which has weighed heavily on the glass industry in France, and that is the systematic destruction of our factories by the German armies. A large number of French glass factories, situated in territories which

were invaded by our enemies in the very first days of the war, were either entirely destroyed or completely transformed from floor to roof to suit the needs of the German army. These factories were returned to their owners after the evacuation in a condition which rendered all exploitation impossible. The reconstruction of these factories was, from the very start, hindered by difficulties of all sorts, and especially by the lack of means of communication and of transport (the railways had nearly all been destroyed), want of stocks of raw materials, of coal, and also of working capital —represented in 1914 by large stocks—which has been pillaged and smashed by the Germans.

"For the twelve glass factories manufacturing champagne bottles alone, which were in the zone of hostilities, the damage done to the buildings and machinery could be valued at 140 million francs at the present cost of renewal. What would the total be if one added that of the plate-glass and window-pane factories, the goblet factories, and the flagon factories, which represented about forty factories destroyed or out of use?

"Thanks to the law of 1919, which confirmed the principle of the solidarity of all Frenchmen in face of the results of the war, our glass factories have received various indemnities, but of these the French Government has, up to now, assumed the burden in the place of Germany, who refuses to pay for her misdeeds. By this help from our Government, our glass factories have, little by little, been able to rise again from their ruins. All are not working again as before the war, but the tremendous effort made by our glass manufacturers, as well as by the great majority of French heads of industry, is worthy of mention. It will certainly be more particularly appreciated in an assembly like the one which I have the honour to address to-day, composed of the most prominent figures in the glass-manufacturing industry, and, consequently, more apt than any other to understand the intense effort furnished and the energy which had to be shown by our fellow-citizens to raise, in the midst of such difficulties, so many important establishments from their ruins. The British, who were our brothers-in-arms on the battlefields, and who helped us to recover our territories invaded by the enemy, will certainly be pleased to learn of, and to note, this effort of their French colleagues.

"For our own part, we know of the efforts which have been made in England to develop and perfect the glass industry. We realise that many new factories have been built during the last few years in your country, all of them possessing the latest improvements; we know also of the continuous efforts of the Society of Glass Technology progressively to increase these improvements

and to make the most of that wonderful product, glass, in all its forms and aspects."

Turning, in conclusion, to his French confrères, M. Houdaille repeated the last paragraph in French, and said that his last word would be to ask his colleagues to join with him in addressing to their English friends their most ardent and felicitous greetings.

Prof. W. E. S. Turner, responding to the greetings thus expressed, said he was sure that he would be speaking on behalf of every member of the party, and, not only so, but on behalf of every member of the Society of Glass Technology in England, when he said that they were deeply indebted for such an auspicious welcome. On their arrival in Paris the previous Saturday they had received an extremely warm welcome from three of the members of the French Syndicate, and, moreover, from the correspondence which had been passing during recent weeks between the English and the French bodies, they had found numerous evidences of a heartiness and kindness which was proof, if proof were needed, that they were going to be received by friends. He trusted that during the course of the week which had just commenced, as they met one another from time to time in conference, and as they travelled about, they would get into intimate acquaintanceship, and, despite the inevitable small difficulty connected with language, he hoped they would be able to tell one another something of what they were attempting to do in their respective countries to meet and overcome their particular problems.

"We in England," continued Prof Turner, "have not an organisation which corresponds exactly with yours; that is to say, we have not a single organisation which groups together all the various branches of glass manufacture under a single head; but we have a number of associations of glass manufacturers, each of which deals with its own particular branch or section. We have, for instance, an Association of Glass Bottle Manufacturers of Great Britain and Ireland—we still retain the old title—and this Association is by far the largest organisation of glass manufacturers. Then there are several smaller associations also concerned with the manufacture of bottles. We have also an association of flint glass manufacturers, which looks after the interests of those who are engaged in the manufacture of table glassware. There is, likewise, a small association which is concerned with the interests of the manufacturers of chemical glassware; and yet another which looks after the interests of scientific lamp-blown glassware—such apparatus as is blown by the mouth at the lamp on the bench. But all these associations pursue their several ways, and are not united in one large organisation such as yours. Con-

sequently, we of the Society of Glass Technology feel that our body is the only one in which all connected with the glass industry can meet and confer with one another, whatever the branch in which they are engaged may be, although our work is of a technical character. We have here with us to-day representatives of most of these sections, and I hope that all may have an opportunity, so far as time permits, of being able to give you some idea of the problems with which we, in England, are confronted. I believe that in many ways we are at present faced with the same type of problems as you are in France. We always have the problems of labour and wages to contend with. But my friends the manufacturers can say very much more about that subject than I. Happily I have nothing to do with these problems.

"Before I sit down," continued the Professor, "there are two things which I am sure all the members of the party would wish me to say. In the first place, we have not forgotten—and my friend, Mr. Webb, who is one of the manufacturers from the Stourbridge district, would probably have reminded me of the point if I had forgotten to mention it—that in a very large measure we, in England, owe the development of our glass industry to the advent into our country of glass workers from abroad. There was no more powerful influence exerted upon our glass industry than by the glass-makers who came from the various districts of France—Lorraine particularly—in order to settle simultaneously at Stourbridge and at Newcastle-on-Tyne. It was upon the basis of their skill and knowledge that a good deal of the glass industry in England was developed. We have at least to thank you for that. It may be a long way back, yet it was the beginning of a serious development in our glass-making practice. The other matter to which my friends would like me to refer is to say, on their behalf, how much they were impressed by the determination, the character, and the persistence with which our French friends and Allies pursued their way throughout the war, without deflection to the right or to the left, and the manner in which, since the war, they have maintained their determination to rebuild France and her industries. We would like to tell you that we feel the utmost admiration for those efforts and to say that you have our very best wishes for the success of those efforts. We would like to add that if any of the members of your Chamber would care to send up to us any questions, we shall be pleased, through one or another member of our party, to supply the information if we possibly can."

Following Prof. Turner's remarks, individual members of the party rose and gave a brief statement of their respective interests

in the glass industry. Col. Halse (of Castleford) mentioned that he happened to have charge of a glass factory wherein they were endeavouring to develop an entirely new glass-forming machine for which they were responsible. It was perhaps only natural that in such a factory the miscellaneous problems of glass manufacture had taken second place to the development of the machine, but, so far as he had anything to show to the French glass manufacturers, he would be very happy at any time to exhibit it and to give all the information possible.

Mr. E. A. Hailwood (Ackroyd & Best, Ltd., Leeds), who spoke in French, expressed the sympathy of the English glass manufacturers for the losses which the French manufacturers had sustained as a result of the war. He mentioned that during the early stages of the war he visited Rheims in the hope of finding a glassworks that could supply them with miners' lamp glasses, and he was sorry at that time to discover that the only glass manufacturers in those parts were bottle manufacturers. He had the opportunity of seeing some of the devastation for which the Germans were responsible at that time, for the particular works that he had hoped to visit were in the line of fire, and it was impossible for him to approach them. Formerly his firm had been compelled to purchase most of their glasses for miners' safety lamps from Germany and Austria, and, seeing that they had supplied somewhere about a quarter of all the lamps that were used in Great Britain, it was essential that they should do something to keep the miners of Great Britain supplied. They were eventually forced to the point of putting down a glassworks to make these miners' lamp glasses, and during the war they were fortunately able by this means to supply nearly 70 per cent. of the miners' lamp glasses that were called for in Great Britain. This experience had given them some idea of the difficulties of putting a glassworks into commission, and it enabled him to sympathise very deeply with the French glass manufacturers in their task of repairing the glassworks which had been so wantonly damaged during the war.

One result of this war-time activity on the part of English glass manufacturers had naturally been that, now that the war was over, it was necessary to secure a fair share of trade for the large factories which had been put down. He had visited many countries since the war, but in every case it had been only to find that there was a tariff barrier against the British manufacturer, and this, combined with the difficulties of the exchanges, had led to a good deal of depression in England. Added to this, the British manufacturers were overburdened at the present moment with

taxation. They positively could not continue in this way. He sincerely trusted that something could be arranged between France and England whereby England could have some work to do for France. The French manufacturers had their own specialities: the English manufacturers theirs. He had seriously wondered whether some plan of action might not be decided upon whereby each could get a share of the other's work. It seemed a great pity that there should be so much unemployment at the present time in England whilst British labour was, so far as he had been able to judge, disposed to be reasonable. It was certainly disappointing to have such a large number of excellently equipped glassworks with insufficient orders to keep them going. He was personally acquainted with many directors of industrial concerns in England who, in the effort to keep their hands going, had spent practically all their reserve funds. When one remembered that taxation in Great Britain was still being continued at a terribly high rate—much higher than in other countries which were connected with the war—one could not help feeling anxious for the future. From what he had seen of the conditions in Europe, he could genuinely say that he was sorry that England and America had not backed up France more than they had done in the policy of the occupation of the Ruhr. He was convinced, from a good deal of travel and personal observation in numerous European countries, that the French attitude in regard to the Ruhr occupation was the only attitude which France could adopt in the circumstances.

M. L. Delloye, who acted as interpreter during these deliberations, and who spoke exceptionally good English, said that he owed his knowledge of the English language to the fact that he resided in England for two years somewhere about fifty years ago. He said he admired the very frank and interesting manner in which Mr. Hailwood had spoken, but, whilst he was prepared to admit that the situation in England was very critical at the present time from some points of view, there was one point which Mr. Hailwood had made with which he could not be in agreement. He was not prepared to admit that Great Britain was shouldering taxation much higher than was current in France. On that point he could not think Mr. Hailwood had received accurate information. It was true that before the war the taxation in France was very light, but the taxes had increased enormously since the war. They had not only a very high rate of income tax, but all sorts of incidental and miscellaneous taxes. Although the Government, in the first place, said that they were going to impose a very high income tax which would embrace everything else, the French subjects were now finding that they had to pay in taxation nearly,

if not quite, as much as was paid in England. He would be very happy, of course, if the English people had to pay less, but it might be some consolation to know that the French people were not in a very much better situation. Another point—far more serious—was the question of competition between the nations. He could quite understand that, so long as there were so many people out of work in England, it was only natural that the manufacturers should argue that it was absolutely necessary for them to increase their output and to sell their goods anywhere and everywhere. At the same time, if some definite plan was not decided upon between the competitors of various nationalities, there would be bound to be disappointments and misfortunes for all. Their friends the Belgians—who were, of course, friends of the English also—had contended that it was absolutely necessary for them to sell their glassware productions without restriction in France, but the French and Belgian manufacturers had had a conference on the subject, and some sort of agreement had been arrived at.

He would like to remind his English friends that it was rather more difficult to settle a question of this sort with a glass-manufacturing country like Belgium, because the manufacturers there had special trading connections all over the world. They were mainly an exporting country so far as glass manufacture was concerned. If, therefore, there was a crisis in a country like the United States, for instance, the quantity of glassware that was normally sent to that country became free, and there was a tendency to throw it immediately upon another market. The situation as regards England was better in this respect, because England had a rather more regular trade and experienced fewer booms and slumps, which were extremely dangerous. At the same time, one had to admit that, during the war, England's production had been increased. New works had been established, and it was only natural that they should claim the right to live. The problem at issue was: how could they so combine things that Belgium could have a share of their markets and England a share also?

M. Delloye proceeded to give an illustration of how, by concerted action, it was found possible some years ago to avert a crisis on the Continent in regard to the plate glass industry. It was discovered, he said, that the plate glass industry was losing millions of francs per annum in consequence of over-production. International correspondence took place on the subject, and a clearing-house was set up in Brussels, where exact statistics were filed regularly in regard to the output of all the works of Europe,

England alone excepted. From this they found out what they already knew, namely, that there was being made about twice the quantity of window glass that could be sold. As a consequence, it was decided to reduce the production and to produce not materially more than was demanded. Prices were fixed, which had to be changed every three months in every individual country, and gradually they succeeded in making friendships between the competitors of the different nations, and at the same time succeeded in saving an industry which had previously been in a very critical situation. He realised, of course, that what they did for plate glass, where the number of works was not particularly large, and where they mostly knew one another, was much easier than might be the case in many other branches of the glass industry. Still, he thought it would be absolutely necessary to find means of getting to know exactly what was going on in the various branches of the glass trade if success was to be grasped in a general sort of way. If the various countries could know just how much they were making and how much they could sell, it would have the effect of preventing any foolish building of new works or increasing of plants where the demand was already met by the supply, and similarly, in the reverse direction, it would lend confidence in the laying down of new plants where the supply was found to be short of the demand. If, on the contrary, every individual country took the view that it must have its share, and increased its productive facilities without any information, there would always be arising dangerous situations somewhere.

Concluding, M. Delloye said that he always considered the English people to be good friends and allies, but it was unreasonable to expect the French manufacturers to go so far as to stop their works in order to make room for English productions. There must be give-and-take in a matter of this sort, but he thought that if things were properly studied together the French manufacturers would be ready and willing to give the English manufacturers what share of trade they could, providing the English manufacturers would be disposed to reciprocate. To obtain good results within a measurable space of time, it would, however, be necessary to set some organisation—some machinery—afoot. The very fact that they met that day under such friendly auspices proved that it was quite possible for them to come into contact and collaboration with one another, and he, for one, would be extremely glad if means could be found for them to come together on this very important issue. He felt that this was the most important point with which he could deal on such an occasion as the present one. He trusted that the British manufacturers

would be willing to consider the matter, and he, on his part, would be quite disposed to provide any information if, in any particular branch or branches of the glass trade, it might be felt that a combination such as he had suggested would be useful and desirable.

The Official Luncheon.

Following the meeting reported above, the visitors were the guests at a mid-day banquet provided by the Chambre Syndicale de Maîtres de Verreries de France at the Hotel Continental. The hospitality was of the warmest, and a sumptuous repast was provided. M. Léon Houdaille presided, and in the positions of honour on his left and right were Prof. H. Le Chatelier and Prof. W. E. S. Turner. The occasion was one that was marked by free social intercourse rather than lengthy speeches. As far as possible the French and English guests were placed at the table alternately, and a splendid opportunity was thus provided for a free exchange of sentiments. Towards the end of the meal the chairman rose and, in the name of the Syndicate, extended a cordial welcome to the English delegates, glass-masters, chemists, professors and experts who, he said, represented there the "brilliant Society of Glass Technology." He desired also to thank particularly the eminent personalities of the French scientific world who had kindly accepted their invitation to the gathering. Amongst the latter were Prof. H. Le Chatelier, whose works were universally known and appreciated; Dr. A. Granger, the Principal of the Research Laboratory of the National Porcelain Factory at Sèvres; M. O. Boudouard, Professor of the Conservatoire Nationale of Arts and Crafts; M. Bertrand, Professor of the Faculty of Sciences and principal collaborator of the Geological Survey of France; and M. P. Lafon, a collaborator of Prof. H. Le Chatelier. He was happy to express to these gentlemen his gratitude for the service which, by their work, they rendered daily to the French glass industry. They had, unfortunately, to regret the absence of several eminent personalities prevented by various reasons from being present at this banquet. M. Léon Guillet, the President of the Society of Civil Engineers of France, and Director of the Central School of Arts and Manufacturers, had been obliged to go to Brussels, where a reception of civil engineers was taking place; M. Hayez, Hon. President of their Chambre Syndicale, had found it necessary to go to Douai on business; M. Léon Appert, Past President of the Society of Civil Engineers of France and Hon. President of the Chambre Syndicale, had had to leave Paris for health reasons; and several other gentlemen who would have been glad to have been present to celebrate this important visit had been obliged

to send apologies for absence. To these apologies he must add those of a great number of glass-manufacturing colleagues whose factories were scattered over many parts of France, and who were prevented by business affairs from taking part in this auspicious function. The great friendship which united the French and British nations, and which manifested itself in the complete solidarity on the field of battle between the British and French Armies, found to-day a new expression in the brotherliness which caused the English glass manufacturers to accept the invitation of their French confrères and to come in such a representative body to the French capital to talk over with them the relative questions of their industry—their progress, their difficulties, and their hopes of renaissance and development. Their coming to France was particularly appreciated because it was certain that the members of the Society of Glass Technology, who, by their work and researches, had constituted themselves an advance guard of the glass industry, would carry back with them to England the conviction that their French confrères were quite as mindful of the necessary evolution in the operation of their industry, and that they were not, by any means, resting upon tradition or old practices. He trusted that their visitors would take into account in the course of their journeys in France and during their visits to the various works to which they had been invited, all that had been done in the country for the perfecting and development of the manufacture of glass, and that, on their return to England, they would tell their fellow-citizens of the vitality of the French industries, that they would assure them that, in spite of the abominable devastation which was inflicted on a great number of their principal factories, the French people had never been discouraged, and that already nearly all those factories had been raised up from their ruins without any help from Germany, notwithstanding the engagements which she entered into by the Treaty of Versailles. He raised his glass to the prosperity of the Society of Glass Technology and to the continued development of the glass industry.

Prof. Turner, who responded, said that he might have wished that some glass manufacturer were in his position at that moment, because a manufacturer would best have appreciated the difficulties of the present situation, and would have been able to enter more intimately into the feelings of their French friends and comrades. His own particular line of work was perhaps less harassed by economic questions than that of a manufacturer; at the same time, his work and department had to depend in a very large measure upon an income from the glass manufacturers, and therefore he could only do his work when the glass manufacturers were

operating actively and with some profit. He was sure, however, that the party from England would, one and all, wish him to thank their French friends for their kindness, cordiality and goodwill. The Society of Glass Technology, right from the outset, had never been confined to any particular phase of the glass trade, and very soon after its inception they discovered that its usefulness could extend beyond the borders of England. He was very glad to recall that amongst the very earliest applications for membership which came to them from abroad were applications from their friends in France, and the Society's membership roll now included quite a number of those who were interested in the manufacture of glass in France. At an early stage it was the intention of the Council that they should endeavour to meet from time to time those members who were resident abroad: to visit them, if possible, in their own countries, and in turn to invite them to pay a visit to them in England. They now saw the fulfilment of that hope so far as their French members were concerned. They were glad, in the first place, that this visit fulfilled the idea of the Society to make any and every little contribution possible to the knowledge that was open everywhere to those who were interested in science and technology; and, secondly, because the visit enabled them to realise that the difficulties of one nation in the matter of glass manufacture were very much the same as those of another, with this exception: in England there were no ruined glass factories to rebuild. The problems of actual production were, however, very similar, and it was fitting, therefore, that they should meet together occasionally and confer about these matters. He very heartily thanked the chairman and all those who had been associated with him for the splendid banquet which had been provided to mark their visit. He thanked the President equally for the kind words which he had expressed in relation to the Society of Glass Technology, and for the friendship which had been extended to each one of them individually. All who had had the good fortune to come from England to take part in that gathering would wish him to say, and to close upon this note, that they hoped and believed that the next meeting of this sort would be in England. He trusted that the present gathering would only be the first of a series at which the British and French glass-makers could meet in social intercourse. When a return visit was paid to England, they would have an opportunity of telling and showing their French friends a little more fully what they were endeavouring to do. He had much pleasure in offering their hosts a cordial invitation to England, and he hoped that it might take place in the near future.

Mr. H. Webb, of Stourbridge, associated himself with all that Prof. Turner had said, and confirmed the invitation. He said he was sure they would all be delighted to meet their French colleagues in England and to reciprocate, either in London or "further along," the hospitality which had been extended to them. It might then be possible to resume the conference which had taken place that morning, and explain more intimately some of the troubles and aspirations of the British glass manufacturer.

The Society's Technical Meeting.

At the conclusion of the banquet, a pleasant half-hour was spent in social intercourse in the lounge of the Hotel Continental, and numerous international friendships were cemented. The party then crossed Paris to the meeting hall of the Society of Civil Engineers, 19, Rue Blanche, and the afternoon was spent in the discussion of six interesting papers. Prof. Turner presided over the gathering, and was ably assisted by M. Delloye, who interpreted the various announcements and comments of the Chairman. Three of the papers were contributed by French and the remainder by English technologists. The papers in question were as follows: "Scientific Method in Industry," by Prof. H. Le Chatelier; "Opaque and Coloured Glasses and Ceramic Glazes of the Same Type," by Dr. A. Granger; "The Expansion of Glasses," by M. P. Lafon; "Specifications for Glass Products," by Prof. W. E. S. Turner; "Improvements in the Design of Recuperative Glass Pot Furnaces," by Mr. Th. Teisen; and "The Physical Properties of Boric Oxide Glasses," by Mr. S. English and Prof. Turner.

In thanking Prof. Le Chatelier for reading his paper, Prof. Turner said that all who had been engaged in scientific work for any length of time must know how the name of Prof. Le Chatelier ranked very high in the world of science. The present generation, and those to come, were indebted to him for many findings, both in the realm of what was sometimes referred to as academic science and in the realm of applied science. He had taken a very deep interest in a wide variety of scientific matters, and they were extremely grateful to him for his present paper, in which he had indicated that the problems of applied science, as most manufacturers would know well enough, were exceedingly complex. It was, therefore, highly desirable that they should be tested by laboratory experiments. It was true that the conditions attaching to laboratory experiments could not always be reproduced in a factory. It was quite easy, for instance, to maintain a very tiny furnace at a constant temperature for some time, but with a large

furnace it was quite another matter—a very difficult proposition. It was largely because of this that one encountered so many variable and thorny factors as it became necessary to translate the results of laboratory experiments into actual practical operations. It was important that experiments should take place simultaneously both in the laboratory and in the factories.

Prof. Le Chatelier had done much for industry. To mention two things only which were important for the glass industry, one recalled, first of all, his researches in connection with pyrometry, which had made it possible to obtain methods of measuring high temperatures with some degree of precision; and, secondly, the great interest he had taken in connection with refractory materials for furnace construction. They trusted, therefore, that M. Delloye would kindly convey to Prof. Le Chatelier their heartiest thanks for his address, coupled with the hope that he would permit the Council to have his address for publication in the Journal.

The Visits to Sèvres and to the Etablissement Legras.

On Tuesday morning, July 3, a visit was paid to the National Porcelain Factory at Sèvres, where the members were much interested in seeing the methods adopted in the manufacture of fine pottery. Dr. A. Granger kindly acted as guide, and willingly answered all questions that were put to him.

The same afternoon a visit was paid to the glassworks of Etablissement Legras, at St. Denis, on the outskirts of Paris This is a glassworks manufacturing a big variety of useful and artistic glassware, and, as was explained to the visitors by the managing director, the factory was established many years ago by M. Theodore Legras, now deceased. At the present time it belongs to the concern known as the Société des Verreries de St. Denis et de Pantin Réunies, there being another works, situated at Pantin, belonging to the Société. As was seen in the course of a tour round the works, the company produces many varieties of glassware, including tableware, goblets, tumblers, decanters, chemical glassware for scientific purposes, bottles, and articles of all sizes and shapes for a host of different domestic uses. Quite a proportion of the output is concerned with fancy glassware, painted in enamels, and sometimes gilt finish. Stencilling and sponging is a favourite form of decoration, and the facility with which the paintresses produced some of the decorations was extremely engaging. A few strokes of the brush for a rockery stump or a tree trunk and the main branches, with a few dabs of the sponge to supply the foliage, and there was a picture complete. It reminded one very forcibly of the methods adopted in

some branches of the pottery trade; indeed, the processes right through in the decorating shops were almost identical.

Formerly the furnaces at this factory were arranged on the Boetius system, but after the war the new company had them transformed, and at the present time all the furnaces are of the Stein recuperative type. The managing director explained that the company is contemplating the construction very shortly of two other furnaces, arranged on the same system, for they had found them to be very economical, and they were aware that recuperative furnaces were also very largely employed in England. Mr. Atkinson, who was a member of the Society of Glass Technology, would be able to give fuller particulars of these furnaces to anyone who required them. Stein & Atkinson's annealing lehrs were also in use at the St. Denis glassworks.

More than 600 workmen are employed by the firm in question, and from what was seen of the men at work they are extremely dexterous and hard-working. It was argued by the management that the work is not now so laborious as it was at one time, for the night shifts have recently been abolished, and this has brought a good deal of relief to the workers generally. The wages that are paid at the present time were considered by the management to be very high.

There was not a great deal to be seen at this particular glassworks in the way of automatic machinery or ultra-modern labour-saving devices. In many respects the factory appeared to be very similar to an ordinary English glassworks. The main impressions that were formed by the visitors were centred round the high degree of craftsmanship possessed by the glass-blowers, combined with the high speed at which they worked.

The Reception by M. and Mme. G. Despret.

After leaving St. Denis, the party crossed the Seine in order to take afternoon tea at the home of M. Georges Despret (Administrator of the Glassworks of Boussois), at 61, Quay d'Orsay. A graceful reception was encountered at the hands of Mme. and Mlle. Despret, and a feature of the visit was the opportunity afforded of inspecting a wonderful collection of artistic glassware, in which the whole family obviously displays a connoisseur interest. This collection must be absolutely unique, each piece having been designed by M. Despret, and made, not for sale, but as an artistic production. The basis of production depends on the use of powdered glass which is heated in a special mould to a temperature sufficient to give a translucent mass. All kinds of tints and colours

are worked in. Some of the pieces take the form of sheets with wonderful landscape effects; others as plaques, two most striking productions being the head of a child in a bonnet and the mask of a woman with fine expression in the eyes. Another remarkable example consisted of a copy in glass of an old Greek marble of the head and shoulders of a child. The specimens were truly a revelation of what can be artistically achieved in glass-making.

A Full Day at Rheims.

On Wednesday, July 4, an early train was taken from Paris to Rheims, and amongst the most interesting experiences of this particular morning must be mentioned a visit to the Pommery champagne cellars, which have a total length of 18 kilometres, with roads and streets running in many directions. Doubtless everyone who took part in the trip will have a greater respect in the future for the champagne industry of France, for few, possibly, had previously realised what a work of care, skill, and patience the manufacture of champagne really is, or the colossal scale on which the industry is pursued, or its import to the glass trade. Millions of bottles of champagne are stored in the cellars, which are cut out of solid chalk, and are reached by descending some hundreds of steps. The settling, de-sedimenting, and corking processes were each demonstrated in turn, and altogether it proved a most informative visit.

The Cathedral of Rheims was also visited, and a brief tour of the city made, a good opportunity being thus afforded of gauging the extent of the war damage and the restoration work involved. Though a tremendous amount of straightening-up has been done during the five years which have passed since the termination of hostilities, it is not difficult for the visitor to estimate the amount of havoc wrought. Although the citizens of Rheims have, by this time, become more or less accustomed to the transformation, they still shake their heads sadly, and remark, " C'est malheureuse ! "

A visit was subsequently paid to the glass bottle works of Charbonneaux et Cie, which is wholly occupied in the manufacture of bottles for the champagne industry. The bottles are made entirely by hand, and to those who visited the works it was emphasised that bottles that are made for the purpose of containing champagne must, of necessity, be able to withstand very high pressures. The contents being much more valuable than the bottle, it is necessary that the utmost care shall be exercised in its formation. For this reason, the company is still adhering to the manufacture of bottles by hand, rather than by automatic

machinery. In other words, they are afraid of taking chances. They feel safe working on present methods and with their present knowledge, and they prefer to remain so. They employ a regenerative tank furnace, fitted with four gas producers. The plant, we were informed, was entirely destroyed by the German army during their incursions; the buildings, too, were all destroyed; but they have been put into tolerably good shape since. At the back of the factory is to be found quite a village of workmen's dwellings, erected on the detached principle. These houses have been built to make good the ravages of the war, which were responsible for the complete demolition of about 40 per cent. of the previously existing workers' dwellings. The position was, of course, an untenable one for a long period, for the houses were within about a mile of the front line. The factory worked until November, 1914, when all the stocks held were disposed of, and the company retired to the centre of France to operate, for the time being, another factory. About 800 workers are now employed, which number represents about two-thirds of the total employees working at the outbreak of the war.

After visiting the factory, the party lunched at the Lion d'Or Hotel, Rheims, and had the pleasure of the company of Madame Charbonneaux and her daughter, Madame Gevignes. M. Emile Charbonneaux, in toasting the Society of Glass Technology, said that it was his great pleasure to bid the members a hearty welcome to Rheims. For the last few years, he said, they had followed with the utmost interest the studies of the Society, and they fully appreciated in France the scientific value of its researches, as well as its firm and matured determination to bring about all the improvements that modern science could make possible in the time-honoured glass industry. He particularly desired to express his thanks both to the technical and industrial personalities standing at its head. He considered it a great honour to have the opportunity of greeting such gentlemen in Rheims that day. "You are paying but a flying visit," proceeded M. Charbonneaux, "to our city, which, as you will have seen, the Germans have almost entirely destroyed. Out of 13,000 houses, 8,000 have been totally wrecked, and 4,000 more or less injured, only a few hundreds being relatively spared. You have seen how, with a stubborn, and quite English-like determination, we have set to work to accomplish the formidable task of rebuilding our town. It has, naturally, taken some time before we could get the estimates ready, the required big loans floated, and all the enormous machinery set in working order. But everything is in full swing now. You have seen houses springing up everywhere, as well as factories

rebuilt, or in the way of being reconstructed, in all parts of Rheims. A large garden city, devised on the same lines as your celebrated English ones, has been provided for the special benefit of families with numerous children. You may realise from this that we are not giving way to depression, and that within a few years a new and active city, full of all resources, will extend again under the shadows of our marvellous Cathedral. I am sure you will carry this thought back to your homes, and I should be delighted if you would think of our town, the seat of so many brands familiar to you, whenever you drink of our famous champagne wine in private or on public occasions. We are keeping quite alive," M. Charbonneaux continued, "the souvenir of those tragic hours when English armies came over to fight side by side with our own armies, and of the prolonged and strenuous efforts which were necessary to prevent the Germans from dictating to the whole world. I personally have twice seen the German troops invade this, my native place—in 1870 and in 1914—but I will never forget that England jumped to our rescue, with the whole of her immense forces, to help us to drive back our invaders. It is, therefore, with a deep feeling of gratitude that I greet heartily all the English friends who have come here to-day to pay a visit to our martyr city. The consequences of the Great War are still weighing heavily upon our allied nations, but we have been closely bound together during the long struggle, and it is my belief that we are not to be less tightly united during the reconstructive period of the Peace. I raise my glass, ladies and gentlemen, to your health, to the Society of Glass Technology, and to the close and permanent friendship between France and England."

Prof. W. E. S. Turner again had the task of responding. He said that most of those who had undertaken the trip to France had found some new friendships amongst the French people, and day by day their kindness and hospitality seemed to increase. The fact was that they had not realised what their French friends were capable of, and, coming as a surprise, the pleasure was all the greater. Their visit to Rheims had impressed them deeply with the amount of destruction which had been wrought, and he was quite sure that the ideas of most of them, both in regard to the extent of the war damage and in regard to the clearing up of the mess afterwards, had been undergoing a change during the past few days. They had all come to learn something more of the point of view of the French people towards the present attitude of their late enemy, the Germans. They had come to have a better appreciation of all that the war had meant to France, and he thought, after having seen what they had, they would be pre-

pared to go back to England and to second such efforts as would make for a righteous settlement of the Peace. He said this much because, as a man of peace, he certainly had felt, now and again, that it would be almost worth while to have peace in Europe at any price. After the last few days, however, and the conversations that he had had, he confessed that he had begun to see something of the other point of view, and to appreciate the attitude of the French nation. He would like M. Charbonneaux and the other gentlemen whom they had met on the tour to know that, from this aspect alone, the visit had been an education to them. He would also like to thank M. Charbonneaux, on behalf of the Society of Glass Technology, for his kind appreciations of what it had succeeded in doing up to now. He would like to say, if in a slightly different form, what he had endeavoured to say in Paris two days previously. Although, when the Society was founded, its desire was to be of service to the glass industry, it was rather natural that the service had been largely directed towards those engaged in the glass industry nearest to the Society's headquarters, namely, in England. But science, of course, knew no bounds, no nationality; and whatever information and knowledge could be gained by research, that knowledge became public property, and was available for all who cared to take advantage of it. They were delighted, therefore, that amongst the first of the overseas glass manufacturers who desired to join the Society in membership were some of the leading glass masters in France, and it was worthy of mention that to-day the French manufacturers, as a body, represented the second largest body amongst the Society's foreign members, the American group of members being largest. He repeated that they all sincerely hoped that their next meeting would be in England, and they trusted that, whenever that happened, M. Charbonneaux and his wife and daughter would be amongst their guests.

Col. S. C. Halse called upon the members to rise and drink to the health of their host, his wife, and daughter. He would like to express the hope that in the future they would have fewer troubles and much more success than in the past. In the City of London they had rather a nice way, to his mind, of expressing such a toast. There, they would put it in this way: "To the Charbonneaux family: May it flourish, root, and branch!" The toast was drunk with musical honours, and the party afterwards boarded motor cars in order to visit the battlefields. The route taken was through the destroyed villages of Cernay, Berrin, Nogent, Beisne, Novroy, and Carmillet, returning to Rheims through Fort Pompelle. Train was taken back to Paris at 4.30

in the afternoon, and for many hours afterwards conversations were carried on at the hotel bearing upon the experiences of the day.

At Fontainebleau.

The whole day on Thursday, July 5, was spent in a visit to Fontainebleau, a name that is well known to most people who have visited France, by reason of its ancient and historic interest. Fontainebleau was a royal residence from probably the first century onwards, and the Palace there, which was altered or extended in turn by practically every new monarch, became the favourite dwelling place of Napoleon I. But apart altogether from this particular phase of interest, Fontainebleau is a name that is constantly on the lips of glass manufacturers the world over, because of the fact that this particular district is renowned for its yield of beds of sand of the highest degree of purity yet discovered.

On arrival at Fontainebleau the party journeyed by motor cars for some eight or ten miles through the forest to the village of Saint Mammés, where there are situated some thirty-year-old sand quarries of M. Albert Bellefille, who is a large exporter of a quality of sand known as "Diamond-crystal." The firm possesses three large quarries capable of producing some 350 tons of sand per day. The cars were parked on the roadway whilst a visit was paid to one of the quarry faces in order to see exactly the geological formation of the sand-beds and the manner in which the sand is quarried or mined. It was shown how the better quality of sand lies beneath a stratum of second-grade sand, which has first to be removed or tunnelled under before the first quality sand can be worked. A private siding runs from the quarry to the railway station at Nemours, and also to a quay on the canal, from which point the sand can be conveyed by water direct to Rouen, there to be transferred to the Channel boats for despatch to England. The whole process was extremely interesting, particularly as M. Bellefille was himself present to give all the required information.

After motoring back to Fontainebleau, a luncheon, in honour of the visitors, was provided at the Hotel L'Aigle Noir. This was attended by numerous influential personages, including M. the Sub-Prefect of the Province, who presided and made a felicitous speech in proposing the health of "The Visitors." Prof. Turner, in returning thanks, mentioned that, from the point of view of the glass industry, Fontainebleau has long been renowned as one of the most important centres in Europe. The glass manufacturers

of England obtained all their best sand from this neighbourhood, and seeing that, in practically all glass, two-thirds of the total raw material used was sand, it was clear that Fontainebleau must necessarily rank as a very important source of the glass-maker's material. They would all take away with them very happy recollections of their visit to Fontainebleau, which had not only been extremely interesting, but most enjoyable from a social point of view.

A Crowded Day at Chantereine, Noyon, and St. Gobain.

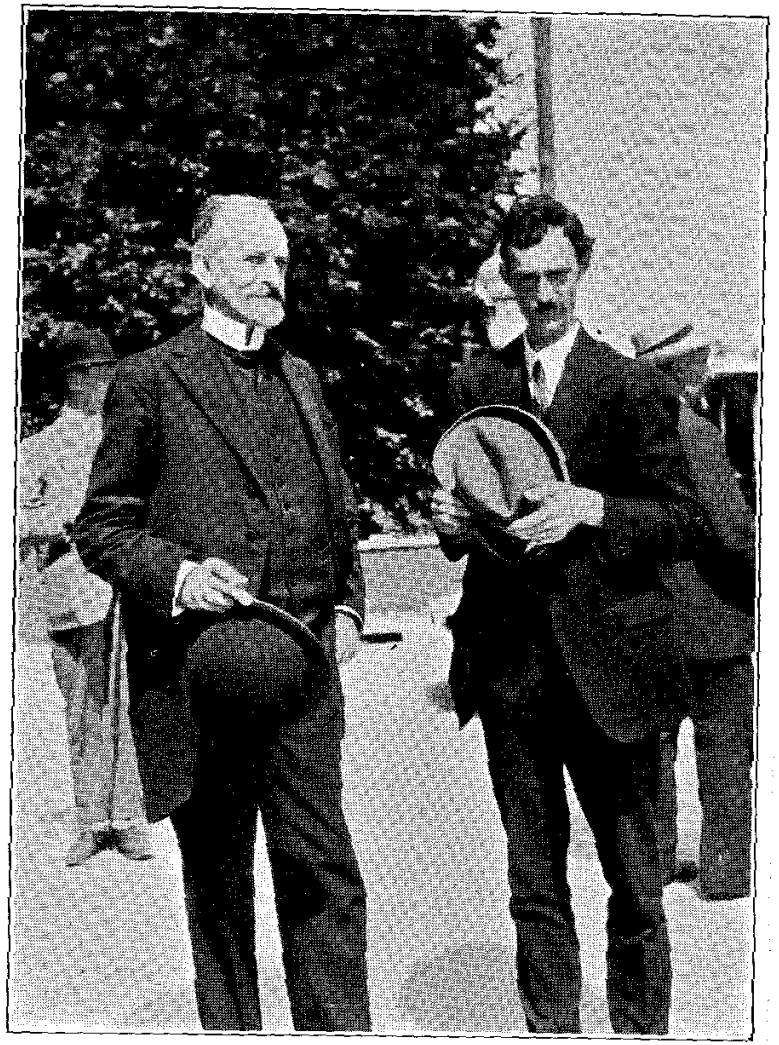
The same evening the majority of the members of the party crossed over from the east to the north stations of Paris in order to spend the night at Compiegne, in readiness for an early start the next morning to an entirely new plate glass factory at Chantereine, a few miles distant. The whole of this new factory has been erected since the war on the most approved lines. On arrival at the works the visitors were given a *résumé* of the geographical situation and lay-out of the new factory, this being made clear by means of a large plan which was placed in the entrance hall. The gentlemen of the party were then conducted into the works, whilst the ladies, who were naturally rather more interested in the lay-out from a social and domestic point of view, were shown the welfare arrangements that have been provided for the workers.

The male members of the party, who were taken in hand by M. Delloye, M. Perrin, and M. Desbordes, were willingly shown all the details connected with the various processes of manufacture. An inspection was first made of the coal stores, and the methods adopted in the handling of the coal, which is received from the canal by means of an overhead steel ropeway. It was explained that, at first, the company experienced considerable difficulty in this connection, owing to the necessity of having to cross the Paris-Brussels main railway line, and they ultimately decided to instal this ropeway, which enables them to pass underneath the railway, since the Chemin de Fer du Nord would not give permission for them to pass above it. The coal arrives at the factory in small trucks, which are suspended from the ropeway, and these are discharged into an immense storehouse. From here the coal is taken, as required, to the gas producers.

At this stage the visitors were shown the mills for grinding the materials for the manufacture of the pots in which the glass is founded. From here the party entered the glasshouse, which is equipped with four melting furnaces and modern plant for handling

AT RHEIMS.

THE PRESIDENT (*left.*) with M. CHARBONNEAUX. (*right.*)



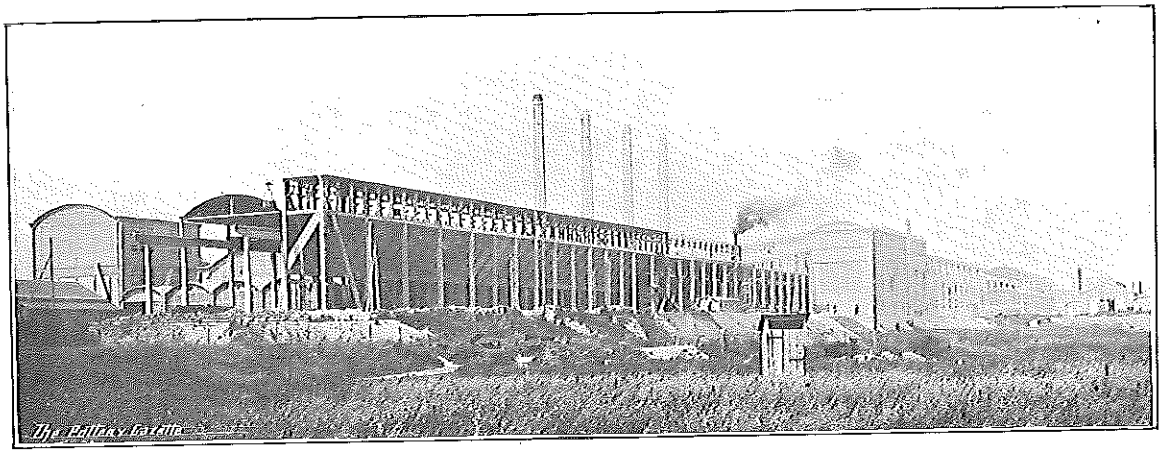
AT NOYON.

M. DELLAYE with THE PRESIDENT.

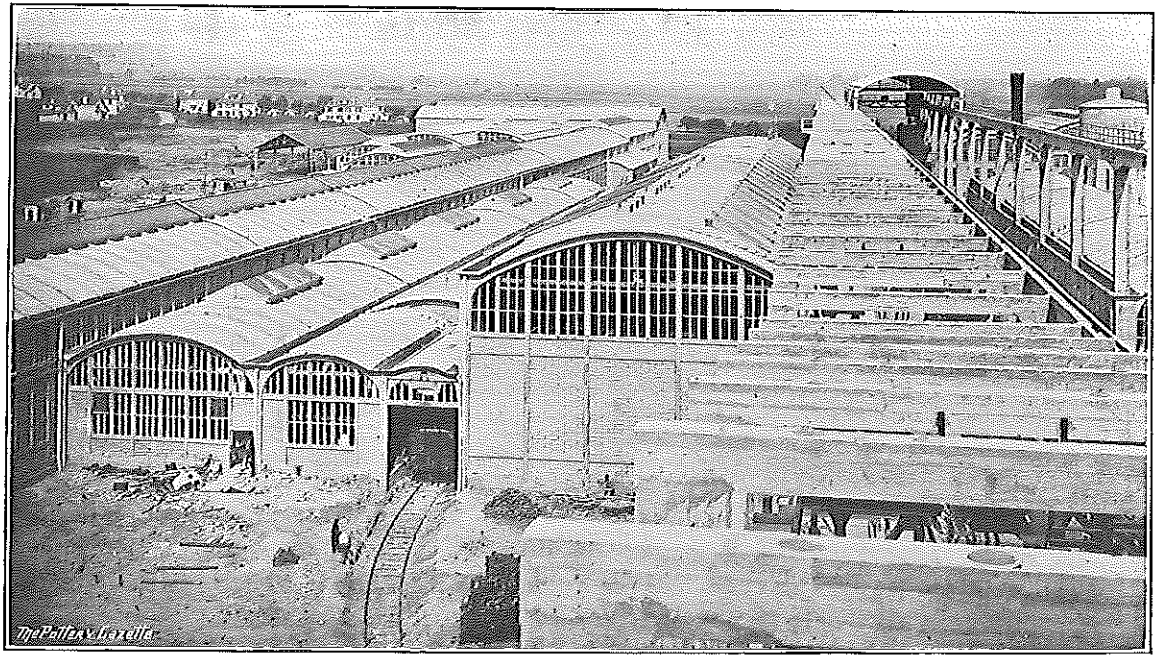
[*To face Proc., p.* 58.

A GROUP AT RHEIMS CATHEDRAL.

SOME OF THE PARTY AT NOYON.



NEW PLATE-GLASS WORKS AT CHANTEREINE.



NEW PLATE-GLASS WORKS AT CHANTEREINE.

[*To face Proc., p.* 59.

the pots, casting, rolling, and annealing. Casting operations were fortunately in progress just at the time of the visit.

The furnaces are gas-fired, from a set of concrete-walled producers. It was remarkable, indeed, to what extent concrete had entered into the construction both of the factory and of its equipment. The gas producers are of the Morgan type, having Chapman agitators and the Chapman system of coal filling. Each coal hopper is fitted with an indicator, which registers the weight of coal filled on.

The batch housing arrangements were next inspected. It was seen that the materials are stored in large ferro-concrete containers, out of which they are lifted by a special type of scoop and conveyed to hoppers above the batch-mixing machine. As each material is thrown into the hopper its weight is registered and recorded—a point worth specially noting. The materials then pass down into the batch mixer, and from there the mixed material is delivered into special bins, from which it is easily transported to the furnace.

The visitors were interested to note the control of the rate at which the lehrs are drawn. Each glass plate is assured of a definite time at a definite temperature. There is not only an electric recorded, but an electrically-propelled indicator.

When the glass plate is withdrawn from the lehr it is moved to and fro between the cutting tables, and from here into the warehouse, by means of large suckers, *i.e.*, rubber discs, which are placed on the plate and a vacuum applied.

The polishing tables were not for the time being in operation. Some of them were still under construction and, when completed, will be capable of dealing with plates of glass 34 feet square. The motors which operate the polishing tables are of 500 h.p.

This glassworks at Cantereine was by far the largest and most modernly-appointed of the factories that were visited during the tour, and the inspection of it was naturally much enjoyed by all who had the good fortune to share in it.

From Chantereine the journey was continued by motor cars to Noyon, where a halt was made at the Hotel Du Mont-Renaud for lunch, kindly provided by the directors of the glassworks of St. Gobain, Chauny, and Cirey. On this occasion—the last opportunity of the tour for any public announcements—M. Delloye intimated that the directors requested him to say that they were extremely pleased to see their guests, and they sincerely hoped that they would take back a happy remembrance of the few days that had been spent in association with the French glass manufacturers. Speaking, as he now did, at Noyon, which place was

well inside the fighting line, and had been almost obliterated from the map in consequence, he would like to say that if England were to support France in bringing Germany to the right point of view it would be to the interest of Germany herself, as well as to the interests of England, France, and the other Allies, for on every occasion when Germany felt that she was likely to get some support from England, Italy, or America, she immediately began to put up a fresh resistance, which was contrary to her own interests and to the rest of Europe. He would like to leave this thought with his English friends as his last word. He raised his glass to England, to France, and to the prosperity of the glass trade on both sides of the Channel.

PROF. W. E. S. TURNER acknowledged the toast and said the occasion was one that provided them with the opportunity of expressing their hearty thanks and appreciation of all that had been done for them. He desired, on behalf of the members, to say how much they were indebted to M. Delloye, and also to his colleagues, M. Penir, M. Doisemaine, and M. Roy, for all their generous assistance both in making the tour possible and in making it pleasant. He said that he did not think that any amount of reading or thinking about the problem could have brought home to him what two or three days spent in the war area had succeeded in doing. He had now been made to understand what terrible havoc the Germans wrought in France during their invasion. He thought all who had taken part in the trip must realise and appreciate and feel ready to support what the French people were attempting to do, namely, to make the Germans pay for the wanton destruction which lay at their doors. Coming more directly to the glass industry, he could see no good reason why there should be anything in the nature of cut-throat competition between the English and the French manufacturers. Rightly directed, he believed there was plenty of work for both, and there were many ways in which they might help one another. Every country had its own contribution to make, and each had a right to make that contribution, and by coming together internationally in industry he thought something might be arranged to take the advantage of all. He was sure that if they cared to take advantage of an opportunity of discussing these questions further, M. Delloye would be found both ready and willing to give them the benefit of his well-informed views. He had been a charming guide and friend during the past few days, and apart altogether from what he had done to make the arrangements of the trip easy and comfortable, they had all been glad to have M. Delloye with them, for himself alone.

Col. S. C. Halse supported, and expressed his delight at having been able that morning to see a factory which, to his mind, had been erected as the result of a combination of the best ideas, collected from various nations. It was a factory which had been started, as all good factories must be, in a green field. In England they were too much inclined to go on patching up the old stones, and refusing rigidly to scrap anything. After having had some experience of Government factories, he was disposed to think that it was not altogether an unmixed evil that the Germans had done a bit of scrapping for France, and if the present factory at Chantereine was to be taken as an illustration of how the new could replace the old, with a clean and fresh start, it might perhaps pay the English people to take a lesson from the scrapping methods of the Germans and do a bit of scrapping for themselves. He supported all that Prof. Turner had said in regard to their indebtedness to their hosts. From every point of view the trip had been a delightful experience and a real education.

On the last afternoon of the trip a visit was paid to the glass-works at St. Gobain, which were also well within the fighting line and occupied by the Germans. This factory, like many others, was badly damaged during the alternating losses and gains during the war. The St. Gobain works were originally a Royal factory in the reign of Louis XIV., and underneath the chateau the old dungeons can still be seen. It was a practice of the nobles in those days to visit the Royal glass works, order whatever objects they required, and spend the rest of the time hunting in the Royal preserves of the St. Gobain forest. The firm still exhibits a glass house pot that was made in the year 1825. This was taken away from the factory by the Germans during the war, but it was fortunately re-obtained from them through the instrumentality of the Reparations Commission and restored to the St. Gobain company. The oldest part of the chateau was destroyed entirely by the Germans during the war, and has since been rebuilt with many modern improvements.

The party returned to Paris the same evening, and made their way back to England in several separate contingents.