The work of the optical society. Co-operation, education, standardisation

This content has been downloaded from IOPscience. Please scroll down to see the full text.

1903 Trans. Opt. Soc. 5 134

(<http://iopscience.iop.org/1475-4878/5/1/306>)

View [the table of contents for this issue](#), or go to the [journal homepage](#) for more

Download details:

IP Address: 143.167.2.135

This content was downloaded on 03/10/2015 at 13:29

Please note that [terms and conditions apply](#).

THE WORK OF THE OPTICAL SOCIETY.
CO-OPERATION, EDUCATION, STANDARDISATION.

PRESIDENTIAL ADDRESS BY DR. R. T. GLAZEBROOK,
D.Sc., M.A., F.R.S.

Delivered before the Optical Society on April 21st, 1904.

THE fact that changes of a far-reaching character are necessary if England is to retain its position in the van of industrial progress is one which is being brought home to us in many ways, among others by the recently published report of the Moseley Commission to America.

"Looking into the future of our own country," says Mr. Moseley in his interesting preface to the report, "I feel bound to record my belief that the régime of the past, however successful it may have been, is obsolete. Honesty, doggedness, pluck, and many other good qualities possessed by Britons, though valuable in themselves, are useless to-day unless accompanied by practical, up-to-date scientific knowledge, and such knowledge only becomes possible with an enlarged and enlightened system of education such as the United States possesses. I am personally convinced that if the British Empire is to hold its own, our old industrial methods will have to be dropped, and especially our present method of popular education will have to be changed."

To-night we are concerned with the optical industry, but Mr. Moseley's general statement applies to it. There can be no doubt, I fear, that in recent years its rate of progress in foreign countries has been greater than in our own; thus, while in the past five years the annual value of our exports to foreign countries of instruments and apparatus, surgical, anatomical and scientific, has risen from £228,000 to £280,000, the value of our imports has grown in four years from £710,000 to £759,000, while in 1902, owing to an abnormally large importation from America, it reached the enormous total of £948,000.*

The fact of German success is continually being paraded before us. The cause does not lie in the greater

* If we go back to 1897, the difference is more marked still; the exports rose from £160,000 to £280,000, the imports from £99,000 to £759,000; but no separate records of imports were kept before 1900, and, no doubt, some portion of this apparent rise is due to this fact.

skill or ingenuity of the German workman—British honesty, doggedness, and pluck are still effective assets on our side—but in the fact that elsewhere the value of science as a commercial factor is more fully realised than with us. Let us see how they have realised it in Germany and in France, and then ask ourselves what can we do to profit by their experience.

I will return later to the efforts the Optical Society has made to apply science to its industry, with a view to considering how in my year of office as your President we may strengthen those efforts and make them more fruitful.

The special catalogue of the Joint Exhibition of German Mechanics and Opticians at Paris in 1900 has often been quoted to you. Let me again, however, at the risk of wearying you, read a few lines.

“At the commencement of the 19th century the French and English makers of scientific instruments were far in advance of the German.” In Germany it is only within the last twenty or twenty-five years that the State has espoused the interests of the home industry in scientific instruments, but such have been the efforts and the results that the position has, at a blow as it were, changed in favour of Germany. . . .

“Soon, also, the necessity was recognised of the close co-operation of the scientific and practical men. Accordingly, in 1879, several scientists, mechanics, and Opticians united in Berlin and formed the nucleus of the German Association of Mechanics and Opticians, which was formed in 1881, and embraced the whole German Empire, having for its object the scientific, technical, and commercial development of philosophical instrument making. The official organ of this Society, the ‘*Zeitschrift für Instrumentenkunde*,’ was likewise founded in 1881, and is devoted to the theoretical and practical development of scientific instruments.

“Specialised schools were established, first in Berlin, then in Frankfort-on-the-Main, and subsequently in many other towns where savants and practical men are combined in training the rising generation in the theoretical departments of the subject. As a result of these serious scientific aims, German mechanics and Opticians sought in their laboratories and workshops the assistance of scientists, and at the present time the

majority of the leading German firms retain one or more experienced mathematicians or physicists in their permanent service.

"The greatest share of the impetus given to the manufacture of scientific instruments, however, is due to the Imperial Physical and Technical Institute, which was established in 1887. . . . This Institution has already done great service, and a large proportion of recent progress is due to its stimulating and helpful influences."

This very frank statement—we need not admit all its claims—brings into prominence three factors of success: co-operation, education, standardisation.

The success of the German exhibit at Paris—and it was a splendid show—aroused our French confrères, and in 1901-1902 the Committee of the Association of Manufacturers of Instruments of Precision published a joint catalogue, with an introduction by the late Professor Cornu, who, after pointing out the danger which had threatened the French industry and praising the skill with which it had been met, concludes:—

"To complete your successful dispositions for the struggle, it remains only to adopt the powerful weapon of association and of self-control—that self-control willingly adopted in view of the general interests; an intelligent union directs all efforts to a common end, instead of employing them in those barren struggles which eagerness after immediate interests arouses in short-sighted minds."

Professor Cornu realises to the full the truth, old as the days of *Æsop*, that joint efforts are necessary to secure a common end. I am glad that at any rate in some sections the British exhibit at St. Louis this year is to be a joint one; and though our progress in England has been slow of recent years, we remember with interest, perhaps also with some sadness, that it was after visiting our loan collection of scientific apparatus in 1876 that Professor Abbe realised that the right way to attack the problem of the microscope was through the glass works.

Co-operation, education, standardisation. What has the Optical Society done to promote these factors of success? The work of the Society is carried out largely by co-operation; it consists now of some 220 members,

practically all closely connected with optical work; the papers I have listened to during the short time I have been connected with the Society have given me a high idea of its aims; the discussions have shown the very real interest which animates its members.

Already I think there is a wiser feeling recognised in the trade. Its members are less afraid of each other; friendly intercourse has rubbed off some corners, smoothed away some difficulties, and taught all the lesson that each has much to learn from his fellows. Competition is not only with your neighbour across the street; that with friends from over the sea is more serious, and can be met best by co-operation.

Local societies have sprung up, connected in a more or less formal manner with our own; the industry is stronger than it was when the first report appeared in 1899.

And now we aim at co-operation on a larger scale. About a year ago a Committee was appointed to ascertain and report to the Council what other bodies will act with the Optical Society in the matter of organising a Convention of Opticians, and what members of the optical industry and others interested in optics would support the movement.

The Committee has held several meetings, and in response to a circular issued to a number of representative bodies and firms has received sufficient support to make it desirable to proceed further in the matter. Accordingly, a meeting has been summoned for next Tuesday to arrange for some definite action, and, if thought desirable, to appoint a committee to organise the Convention and determine the questions that should be brought before it. It is thought right that this committee should be entirely independent of any existing organisation.

Let me indicate very briefly some of the matters which might come before such a Convention. The question of standardisation I will refer to later, but it is clear that it would be desirable to arrange, if possible, that decisions which we may arrive at should be discussed by a larger public, and should receive a wider acceptance than is possible if they are confined to our Society only.

The steps desirable to organise the technical educa-

tion of the Optician need very careful consideration. Useful opinions might be elicited by a judicious paper, and discussion at the conference. The question of an English exhibition of optical manufacturers and processes also deserves consideration, but let me say that I trust that if any such exhibition is organised it may be arranged to show the joint result of English industry and skill, and not merely to expose the wares of rival houses.

Let me give an illustration of my own experience in 1900 at Paris. A generous supporter of my laboratory had placed a sum of £1,000 at my disposal for the purchase of apparatus, and I was instructed to go to Paris and investigate how to spend it. I went first to the English section. I saw a number of glass cases arranged like shop-windows, with beautiful apparatus behind the glass, and I was met by a stalwart representative of the London constable, Division A, some 6 ft. 2 ins. in height. I see a dozen or twenty similar splendid men have been sent to St. Louis for a like purpose—who guarded everything with splendid fidelity and jealous care. To unlock a case or let me handle a piece of apparatus was a thing unheard of. Robert was very ready to gossip of Paris, and the dulness of his lot shut up in the Exhibition building all the day, but as to helping the exhibitor to sell his wares that never entered his head.

I passed on to the Swiss Exhibit. There was a notice to tell me that M. X. in the Bureau would give information as to the goods of which I was in search. On enquiry, M. X. was ready to open the cases, to let me handle the instruments, to explain their action. One instrument of which I was in search was not in the Exhibition. A note was taken, and in the course of a week or so full information came from Zurich.

The same happened in the German Exhibit. The catalogue was handed me, and I was told to mark the instruments I wished to examine, and opportunity should be given me of seeing all. One day a representative of Messrs. Zeiss met me to discuss optical instruments, on another day I had the metrological and electrical apparatus at my disposal. It is sufficient to say that in the end a large fraction of my £1,000 was spent outside England.

I think that a representative exhibition of English

instruments, arranged to show the best that we can do, would be of distinct service to the industry. Perhaps some such may come out of our proposed Convention.

Education.—The Optical Society has realised the importance of this, and in co-operation with the Northampton Institute has already taken steps of real moment. The need for education was put most clearly by Professor Thompson in his address at the Society of Arts, just two years ago, and the discussion showed how fully the need was realised. Your Council in 1901 proved, by the appointment of a special Educational Committee, that it appreciated your responsibility in the matter, and the case for a large effort was put before the Technical Education Board in a statement read by Mr. Conrad Beck, which presents the matter in the most admirable manner.

Meanwhile, not very much has been done, the change in the Education Authority for London has caused delay, but it is understood that the Technical Education Board has passed on the proposals, with a strong recommendation for the favourable consideration of the new authority.

Some progress, however, has been made; there is now a special Optical Department at the Northampton Institute, and valuable experience is being gained which will be of real service in preparing for a larger scheme.

The report which Mr. Aitchison, to whom the cordial thanks of the Society are due for the energy and self-sacrifice he has displayed in promoting the scheme, laid before our meeting in February, is most hopeful reading. During the current session the number of students is 135, and the class entries 454.

He was able to say that "the assistant class seem to bring a greater degree of intelligence to bear upon their work, and they now see that, other things being equal, the man who has the greatest amount of knowledge of scientific optics is the man the employers want, and are determined to have. I must confess that I have been both surprised and pleased to see the zeal with which men who have family ties and associations to distract their attention after working hours, still find time to put in a fair amount of study in the classes at the Institute."

The cost of these classes has been about £1,000, and towards this the trade has contributed a sum of one

hundred guineas. But good work though this is, Dr. Walmsley and Mr. Aitchison would be the first to admit it needs great extension. Dr. Walmsley, we know, has large ideas, and a recent journey has not tended to limit his horizon.

At a fitting time the new Educational Authority for London must be reminded of the urgent need for a larger and more complete organisation, and it will be for your Council to consider what part the Optical Society must take in forwarding the good work they have started.

New buildings will be erected, while a larger staff and apparatus and machinery of a modern kind must be supplied. Education, of course, is not everything, but it is essential; let me remind you of President Roosevelt's remark to the Moseley Commission: "Education will not save a nation, but no nation can be saved without education."

Therefore, let the Optical Society insist that the necessary education be provided, and to show their zeal let its members continue to help as heretofore in that provision.

We turn now to the last of our three factors of progress: "Standardisation," the application of scientific methods and standards to the organisation, and the checking of your work. Here, also, the Society has not been remiss. The various sub-committees of the Optical Standards Committee have had many meetings. The interim report presented to-day, which is to be discussed next meeting, was not arrived at without much solid work. There are other questions still under discussion, which will be brought before you in due course, and I venture to think that when the complete report is issued a very notable and important result will have been achieved.

I need not discuss with you the importance or the necessity of standardisation; they are obvious, a visit to two shops, in one of which the modern practice of repetition work is adopted while in the other ancient methods are adhered to, is sufficient to convince the doubter.

But to advocate repetition work, to issue reports, to frame definition, is not enough; you need material standards in many cases, and in all you want the means of testing your results and of discriminating between,

shall I say good, better, best, or good, bad, and indifferent?

In Germany, as we have already been told, "a large proportion of recent progress is due to the stimulating and helpful influence" of the Reichsanstalt. I desire that a future President of the Optical Society may say some years hence, when reviewing the progress of your trade, that a large proportion of the advance is due to the work of the National Physical Laboratory.

At present we have not done much, our optical equipment hardly exists. If you pay us a visit, as I hope you will, this summer, it will be to spy out the nakedness of the land, but the fault, as I have already told you, is in part your own. The demand for improved optical tests has hardly been sufficient to justify a large expenditure on the part of the Committee.

I welcome the request made to me some little time since to organise tests for Opticians' test cases, and I trust the Committee, which has been appointed to discuss the details of the tests, may be the forerunner of others; but to carry out such tests I must have your support in the appeal which must be made to the authorities for funds, and I must have your practical help in devising and in making the instruments and apparatus required.

For the latter, I have to thank some of you already. Let me give you two instances: A well known Optician was visiting my laboratory some few days since, and, after expressing his interest in what he had seen, said he must have his grumble. My photographic lens testing apparatus was behind the time. I put a bold face on the matter, admitted the fact; said I had no money to buy a new one, which would cost £100, and asked if he would give it. I will give you half the cost, was his generous reply.

Another firm wrote recently from Manchester, offering a liberal contribution to the cost of apparatus required for optical tests. When it is once realised that your trade requires standardisation, it must come, and I shall esteem it a privilege to work with you to secure it.

It seems, then, that we are beginning to appreciate the importance of those three factors, Co-operation, Education, Standardisation, which have already proved so beneficial abroad. The Society is working on the

right lines; it will be the business of the officers and Council during the session now in progress to see that it goes forward and prospers.

MR. HYATT-WOOLF said he rose, not, of course, for the purpose of criticising the address—that would be extremely unorthodox, and were he moved to do so there was very little room, anyhow, for criticism of an adverse nature. He complimented the Society on having such a President as Dr. Glazebrook, and stated that the point which particularly pleased him about the address was the reference to an Optical Convention, of which they would hear more at the preliminary meeting to be held on the following Tuesday, and which, he hoped, they would all attend. He reminded his hearers that a Convention would not be, as usually assumed, the first of its kind in this country, although, probably, the previous Convention was not regarded as such by those who convened it. Still, it had a very great effect upon the industry. The meeting was held some 14 years ago, and the outcome of it was what ultimately came to be known as the “Battle of the Bridge.”

No doubt all his hearers remembered this famous astigmatic bridge case in which one particular firm claimed the monopoly of what had since become a very important department of the industry. In that case a large number of optical houses were represented, and a scheme, not dissimilar to that suggested by Dr. Glazebrook, was then discussed. Nothing very tangible, however, came of the meeting, but still the seed was sown, and it was out of it that had sprung up, in a way, the present work. Another of the main features was the outcome of trade journalism, and from that had come all their present progress, although trade journalism itself had not met, in certain quarters, with the support it merited. Dr. Glazebrook had reminded them that if they did not go ahead they must go backwards. The position they occupied was comparable to a train standing on the railway lines. If they did not go forward they would either be shunted on to a side track or knocked off the line altogether. What they now wanted was a leader, somebody of energy and enterprise, of determination and originality, to organise their movements for them and to lead them with words and actions, and such a man had been found, he thought, in their

President. He looked forward to very great advances in the industry. Mr. Woolf, in concluding, proposed a vote of sincere thanks to Dr. Glazebrook for his address.

MR. ARCHISON, in seconding the vote of thanks, said he was sure they all felt very much the honour Dr. Glazebrook had conferred upon them by accepting the Presidency of the Optical Society for the present year. The influence which such a President would have on the work of the Society, and through the Society on the trade, would be very great indeed. One of the great drawbacks in England had been, he thought, the lack of sympathy and intercourse between the leading scientific men in the kingdom and the actual workers, and he trusted that the advent of Dr. Glazebrook would form a precedent for other leading scientific men to join the Society. This would lead to that state of progress which was so evident on the Continent. With regard to the contributions that the trade had given towards the funds of the Northampton Institute, it might be understood from Dr. Glazebrook's address that only 100 guineas had been subscribed. As a matter of fact, 300 guineas had been subscribed during the past four years.

DR. WALMSLEY heartily agreed with all that had been said, and desired to personally express his own thanks to Dr. Glazebrook for his address. To his mind, the most interesting part of the paper was the reference to the lines on which the Society had been conducted since its start, and remarked that the organisation was due to a desire for co-operation in the minds of a few members. He most heartily thanked the Society for the assistance given to the Northampton Institute, and not only for the monetary assistance but for the advice and hints tendered by different members of the Society as to the conduct of the work at the optical classes carried on at the Institute.

MR. HYATT-WOOLF then put the following motion:— That a very hearty vote of thanks be passed to Dr. Glazebrook for his address. The motion was unanimously passed.

DR. GLAZEBROOK, in reply, said he desired to thank them all for the way in which they had received his address. There were a few other matters he should, perhaps, like to refer to briefly, and a little less

formally. In the first place, with regard to Dr. Walmsley's remarks as to the lines on which the Society had been founded and on which it had been worked. On looking through the reports of the Society and the papers which had been read at its meetings, he had been greatly impressed by the wisdom of those who controlled the Society, and the useful way in which they had guided its work. It was after reading through those reports that he selected the title of his address. Then Mr. Aitchison spoke very kindly about what he had termed the honour done to the Society by his acceptance of the Presidency. He assured them that in so doing they were only enabling him to realise in part what had been his ideal for many years back. During the period when he was at Cambridge, both as student and teacher, he had a feeling, as soon as he realised the position of English industry to English science, that the two should be brought into closer touch, and when that opportunity arrived, in the establishment of the National Physical Laboratory, of bringing scientific knowledge and skill to the aid of the industrial workers, he felt that he was taking one step towards the work he had long had in mind. He realised most fully that the work of the National Physical Laboratory would not be of real value unless those who controlled it, and who carried on the work, were thoroughly trusted by the industrial side of the nation. He accepted it as a pledge of this co-operation between scientist and worker, that they looked to the National Physical Laboratory to bring, in time, some real assistance to the industry, and that they had also elected him to the post of President. He also asked them for their co-operation as practical Opticians, and was sure he would obtain it. He also asked for co-operation in another matter. He had been grieved to find that the numbers of the Society were not quite as large as they were a year ago. He was sure that there were many men in London and in the country who would profit by becoming members of the Society, and he thought all present would be doing good and useful service if they could say that they had brought a friend to join the Society. That would be a good example of co-operation.