

results. The pictures may also be projected in a size of 3-4 ft. diameter on a lantern screen.

Until the advent of a really rapid and satisfactory bleach-out paper, there is no possibility of recording the photograph on paper in colours, and since they can only be viewed in or by means of the camera itself, and the latter (which costs somewhere about 60*l.* at present) will always be a somewhat expensive apparatus, even if the optical and mechanical parts can be further simplified, the process is scarcely one that is likely to become general. That indeed was recognised from the start of the experiments. Nevertheless, given the camera, the process is undoubtedly a simple method of colour photography to work, and this, together with its true colour rendering and the many interesting and quite novel effects to which it lends itself, will, it may be hoped, encourage plenty of other workers to take it up, besides those who may be disposed to experiment with it from the point of view of its scientific interest.

THE FORTHCOMING OPTICAL CONVENTION.

THE issue of a programme of business by the committee of the Optical Convention, which is to meet in London on June 19-26 next, marks the entrance of this undertaking upon a new stage in its development. The idea of an optical convention is not new—in fact a meeting, the first of the kind, was held in London in 1905, and it is out of that gathering that the present proposal has grown. The committee has secured support of a substantial kind in the form of a guarantee fund, which puts the undertaking on a secure financial basis and will enable the catalogue and volume of Proceedings to be produced.

Underlying the whole scheme of the Optical Convention is the fact that optical appliances in one form or another are familiar, at least as tools, to everybody. This circumstance, and the interest of the scientific problems which present themselves for solution in the manufacture of optical instruments, give to optical manufacture its special place in the view of scientific men at large and of those leaders of thought who occupy themselves with the realities of the public weal. It is therefore by no means so surprising as it is pleasant to find that the Board of Education on one side and the scientific societies on the other are furthering the scheme and assisting to bring the plan of an optical convention to a successful issue.

Another aspect of optical work is its national importance. It is probably not realised, even by men who are fairly familiar with the developments of applied physics, how the progress of manufacture is dependent on the provision of the special optical and scientific instruments required at each stage of its development. Field-glasses, gun-sights, range-finders, and numerous other purely optical instruments are absolutely essential in the equipment of any fighting force at the present day, and it is vital to our national interests that we should have, within our own borders, the means of producing such instruments in sufficient quantity for the use of our sailors and soldiers.

The experiment of holding the exhibition in connection with this Convention in the buildings of the Science Museum at South Kensington will be observed with considerable interest, no doubt, by the officers of the Education Board, and certainly by the scientific public. Some years ago, when the Science Museum was much less completely organised than at present, a departmental committee was appointed to

consider its organisation and to report upon the improvements that might be made. Among the proposals which commended themselves to that committee was a suggestion that an empty hall should be built, as part of a reconstructed museum, which might be available for purposes of this kind. That proposal is, no doubt, receiving the attention of the authorities at the present time in connection with their rebuilding plans, and it will be of value to them to be able by this experiment to make themselves practically acquainted with the working of such an arrangement. The Art Department at South Kensington already possesses accommodation of this kind in the unoccupied North Court of the Victoria and Albert Museum. If such a building is provided in connection with the Science Museum, with suitable equipment and under proper regulation, it may, we think, prove to be of very great value in establishing and developing a fruitful connection between scientific work and the practical aims of the industrial and manufacturing community.

Attention may also be directed to the very interesting loan collection of optical instruments which is to be exhibited. This loan collection cannot but be full of interest, not only to the student who desires to see how any particular instrument has grown by successive developments to its present stage of efficiency or otherwise, but also, as is often the case, it may contain the germs of still further discoveries which may yet have to be worked out by the efficiently trained minds of our men of science and manufacturers.

The committee of the Optical Convention has, as we are glad to see, realised that the establishment of such relations in their particular departments ought to be a principal object of their undertaking. From the provisional programme, it appears that the scientific societies in their corporate capacity will take a prominent part in this Convention. We observe that the Physical Society, the Royal Astronomical Society, the Royal Photographic Society, and the Optical Society have all arranged for joint meetings with the members of the Convention, and that their several presidents will be presiding at these meetings in the character of vice-presidents of the Convention.

This close connection of the leading scientific societies, having special interests in optical science, with the Convention is not the only way in which the interest of the scientific public is to be manifested and utilised. The scheme of operations comprises a somewhat elaborate plan for making the work of the Convention subservient to the practical aim of improving the design and construction of optical instruments. With this object, a highly qualified committee, announced under the name of the cooperation committee, has been organised. Its members are all very distinguished men, but it is not to their initiative that the Convention trusts for suggestions of the lines along which improvement ought to move. A schedule of inquiries, which has been very extensively circulated during the last few weeks, will, through one or other of the learned societies of London and the Provinces, have come into the hands of most of our readers. It is intended to elicit the expression of private and personal opinion by all users of optical instruments. That is substantially equivalent to saying of all who are engaged in exact scientific work.

These inquiries are intended to produce not so much suggestions for improvement as suggestions of existing defects and desiderata. The committee is to be informed what it is that the users of optical instruments desire. From the material so supplied it will draw up a report in which it may be presumed that the matter of value communicated in answer to this

widespread inquiry will appear in a refined and systematic form. How far the demands of the public in this direction can be satisfied remains to be seen, but probably the committee will not consider itself responsible for supplying the requirements of its public. It will be a great matter if these requirements are expressed articulately and stated in such a scientific form that the attention of inventors and manufacturers may be concentrated upon the lines of useful and necessary advance.

The undertaking is one the development of which will be watched with considerable interest. If it should prove that the requirements of the professional man, with whom some optical instrument is part of his equipment, can in this way find useful exposition, the idea is one for which there may prove to be a great future, since it opens up a new line of cooperation between the scientific world and the world of industry, and one which, if it brings them together successfully, will bring them together on a very satisfactory footing.

Among the attractions of the exhibition is one, we observe, which caters for the taste, so much developed in recent years, for the realistic representation of by-gone days. An "Isaac Newton" room is to be fitted up in which the leading experiments described by Newton in his "Opticks" will be reproduced by means of apparatus constructed in accordance with Newton's description of the appliances which he himself employed. An arc lamp will make Newton's successor independent of the sunshine, but in all other respects he will follow closely in Newton's footsteps. Another room will, in like manner, be devoted to the demonstration of Fresnel's crucial experiments. That these demonstrations will be among the most popular features of the exhibition cannot be doubted, but the popular appeal should be the smallest part of their merit. There is nothing more stimulating to the modern student than to realise with what slender resources and imperfect appliances some of the great scientific discoverers have accomplished their greatest work.

THE USE OF PEDIGREES.¹

INFORMATION about family history can be presented most clearly by the use of tabulated pedigrees. Until recently, genealogy has shown a tendency to lay principal stress on the single line of paternal descent, as is shown by early heraldic rolls and other records. Nevertheless, the heralds' visitations were founded on the sound idea of a complete genealogical survey of one section of the nation.

The hereditary descent of physical and mental qualities may often be traced in pedigrees prepared for general purposes, but is better shown in diagrams where the character to be traced is indicated in symbolic form. Instances may be given of the transmission of scientific, administrative, and legal ability, of good and bad character, of mental defect, or of special liability to tuberculosis. Almost any physical or mental character may be traced, and shown to be definitely hereditary. It is impossible to explain the facts by the influence of environment alone.

In some cases, such as in eye colour and certain diseases and physical defects, the laws of inheritance have been shown to be definitely Mendelian in character, and it then becomes possible to predict the average result of any given marriage.

Regarding the nation from the point of view of its innate qualities, the question of selection becomes of supreme importance. In present conditions, what

qualities tend to be preserved and what tend to be bred out of the race? There is evidence to show that, on the average, in England the people of the towns are shorter and darker than country dwellers. This fact seems to suggest a gradual increase of the Mediterranean elements in our urban population at the expense of those of northern or Teutonic origin. Again, the modern phenomenon of the limitation of families is most marked among the careful and thrifty in all ranks of life; the careless and casual tend relatively to increase. It seems probable that the nation may tend to become shorter, darker, more emotional, and less rational and self-controlled. Until lately, no attention has been paid to racial considerations; but a genealogical survey of the people is at least as important as a geological survey of the land, for the character of the race is the greatest of national possessions.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Dr. Shipley (Master of Christ's College), Prof. Punnett, Mr. C. Warburton, and Mr. H. Scott have been nominated to represent the University at an International Congress of Entomology to be held at Oxford in August next.

DR. JOHN SATTERLY has been appointed lecturer in physics at the University of Toronto.

MR. J. HENDRICK, lecturer in chemistry at Aberdeen College of Agriculture, has been appointed professor of agriculture in the University of Aberdeen.

THE annual dinner of the Royal School of Mines Old Students will be held on Wednesday, June 12, at the Imperial College Union, South Kensington. Several distinguished guests have already accepted invitations to be present, including the Right Hon. A. H. D. Acland (chairman of the Education Committee of the Imperial College), Sir Alfred Keogh (Rector of the Imperial College), Mr. F. G. Ogilvie (Board of Education), and Mr. Edward Hooper (president of the Institution of Mining and Metallurgy). Mr. W. Frecheville, who has just been elected to the chair of mining in succession to Prof. Herbert Cox, will preside at the dinner.

A CORRESPONDENT in *The Electrical Review* for May 3 directs attention to the serious inconvenience to students caused by the City and Guilds of London Institute examinations being held at the end of the Easter holidays, three or four weeks after the teaching has come to an end. The question whether there should be an interval between the teaching and the examination is an important one, and it would be well to have the opinions of the best students on the matter. Those who advocate an interval claim that it is in the interest of the student, who by its means has an opportunity of digesting the information he has received. The University of London, for example, ceases its courses for the degree examination at the end of June, although the examinations do not take place until October or November.

THE London County Council proposes to award in July next a certain number of free places at the Imperial College of Science and Technology, South Kensington, for the session beginning in the following October. The instruction will be of an advanced nature, suitable for students qualified to enter on the fourth year of the college course. There is no restriction as to income, but intending candidates must be ordinarily resident within the area of the administrative County of London, and must be

¹ Abstract of a discourse delivered at the Royal Institution on Friday, May 3, by W. C. Dampier Whetham, F.R.S.