supply, and are evidently inspired by a determination to give something like concrete value for public money.

While awaiting the verdicts of science and the deliberations of legislators, it is useful to have to hand a work such as this, which gives a concise statement and accurate picture of the present condition of the great sea-fishing industry.

The book is abundantly supplied with interesting photographs. There is also a sea-fisheries map, in which, however, is one glaring defect. From this map it would appear that Yarmouth and Lowestoft are given over entirely to the drift-net fishing, and that neither of these places has any connection by rail with the metropolis. This is inconsistent with what is stated in the text, and is opposed to common knowledge.

THE ELEVENTH EROS CIRCULAR.[1]

THE appearance of this volume brings us definitely face to face with a new situation in the derivation of accurate positions of the heavenly bodies from photographs. It will be remembered that in the winter of 1900–1 the recently discovered small planet Eros made a very near approach to the earth, and a large number of photographs were taken with the view of determining the distance of the planet, from a knowledge of which that of the sun, and the dimensions of the solar system generally, could be inferred with (it was hoped) considerably improved accuracy. The measurement of the plates involves enormous labour, and has only been partially accomplished in the intervening four years; and the discussion of the measures has necessarily proceeded even more slowly. But the present publication of more than 400 quarto pages represents a notable addition to the tabular statement of measures, and contains an important contribution to the discussion.

It appears that the plates taken at different observatories are liable to disagreement in a serious manner. Putting aside the planet itself for a moment, when the positions of the stars found from plates taken at the Algiers Observatory are compared with those found from plates taken at Paris, there is a difference varying with the brightness of the individual stars. Such a difference is not altogether new in astronomy; it was pointed out by Sir David Gill a dozen years ago or more that eye observations of stellar positions made by different observers were likely to differ systematically in this manner; but this was attributed to human defects in the observer, and it was hoped that photography would free us from the embarrassment. So it probably will when rightly used; but we have apparently not yet completely realised the necessary precautions. The instruments for taking the photographs at Algiers and at Paris are as precisely similar as the constructor could make them; they were used in the same way; the plates were measured similarly and with careful attention to certain known sources of error, and yet the resulting star places show the following differences in seconds of arc in the mean of 5 groups of 87 stars each :—

Mean magnitude	Difference
	″
8·8	−0·27
9·4	−0·42
10·4	−0·57
11·2	−0·72
11·6	−0·83

There is a range of more than half a second, and we want to measure the hundredth of a second! This is probably an exceptional case; but what may occur once may occur again, and in view of this fact it is not too much to say that a very serious addition has been made to the labour of determining the quantity sought—the solar parallax—by this revelation.

It is disappointing to find no satisfactory suggestion of the cause of error in the paper which gives an account of it. A suggestion is indeed made, viz. that in measuring a plate the presence of an adjacent image (for the exposure is repeated on the same plate so as to show all the images more than once) may disturb the eye of the measurer. All our experience hitherto is against such a possibility. It seems more likely to the writer that the cause may be sought in the object glass of the photographic telescope, and, to be more precise, in an error of centreing of the crown lens relatively to the flint. Such an error is well known to opticians, and is easily detected in a visual telescope by the fringe of colour on one side of a star image when slightly out of focus. But the images formed by a photographic telescope are not examined by the eye in the regular course of work, and such an error might therefore escape detection until revealed by such a comparison of measures as is given above. The stray light on one side of the image would not be strong enough to affect the sensitive film in the case of faint stars, but for a bright star it would spread the image in that direction, and so introduce a spurious displacement of the centre. If this explanation be correct, the error can be both detected and eliminated by turning the object glass through 180° (with most forms of telescope mounting it is only necessary to turn the telescope to the other side of the pier), and this can easily be done. Indeed, it ought to have been done before now, under the admirable maxim for physical work, "reverse everything that can be reversed," but, so far as is known to the writer, the point has hitherto escaped notice.

If on examination this explanation will not fit the facts, some other must be found. A few additional details in the volume before us would have made it possible to test this hypothesis; if, for instance, it had been specified which plates were taken on one side of the pier and which on the other, a comparison of the two sets would have given very definite information. Mr. Hinks has already given cogent reasons (see *Observatory* for September, 1903) for regretting the lack of information as to the identity of the individual plates, and we have now to add this further reason. For the systematic difference described is not confined to Algiers-Paris. If we turn to the paper following that in which M. Trépied gives the figures above quoted and arrange the differences found at the Goodsell Observatory (Carleton College, Minnesota) according to stellar magnitude, we find a well marked effect in R.A. and a smaller one in dec.; and probably other cases, when duly examined, will give similar results, though it does not seem to have occurred to astronomers generally to make a properly searching inquiry. For instance, at the end of the volume M. Lœwy tabulates a series of differences between two lists of star places prepared with great care by himself and by Prof. Tucker, of the Lick Observatory, and he comments with satisfaction on the close accordance of the two lists. But a very slight examination suffices to show that the differences are affected with "magnitude-equation," though in this instance the effect may be due to the visual observations.

In fact, while duly admiring the energy and diligence with which this vast mass of material has been collected and published, a result due in great part to the powers of organisation of M. Lœwy, the director of the Paris Observatory, we may well feel some doubts whether it will turn out to be, as he hopes, a "collection of *homogeneous* material, susceptible of being immediately used without the necessity of undertaking,

[1] Conference astrophotographique internationale de Juillet, 1900. Circulaire No. 11. (Paris : Gauthier Villars, 1904.)

as in the past, long and tedious preliminary investigations" (p. 3). Homogeneity for such a purpose cannot be secured by mere similarity in publication of results; indeed, this very process tends to cover up vital differences of detail, and it is to be feared that, unless these can be unearthed again, the work will suffer in accuracy.

There is an appendix at the end of the volume professing to give a bibliography of the already large literature on the Eros campaign, but containing no reference to the *Monthly Notices* or other English work. Is not this rather a strange oversight?

H. H. TURNER.

NOTES.

BRITISH science has been honoured by the award of the Nobel prize for physics to Lord Rayleigh, and the prize for chemistry to Sir William Ramsay, K.C.B., F.R.S. Prof. Pavloff, of the Military Academy of Medicine at St. Petersburg, has been awarded the prize for physiology. The distribution of the prizes took place at Stockholm on December 10 in the presence of King Oscar and the Royal Family, foreign ministers and members of the Cabinet, and many leading representatives of science, art, and literature. After speeches had been delivered by the vice-president and other representatives of the Nobel committee, and of the Academies of Science, Medicine, and Literature, King Oscar personally presented Lord Rayleigh, Sir William Ramsay, and Prof. Pavloff with their prizes, together with diplomas and gold medals. The sum of money attaching to each prize amounts to about 7825*l*. The distribution of the prizes was followed by a banquet, at which the Crown Prince presided; and among the company were Prince and Princess Charles, Lord and Lady Rayleigh, Sir William and Lady Ramsay, and M. and Mme. Pavloff. Count Mörner proposed the health of Prof. Pavloff, Prof. Petterson that of Sir William Ramsay, and Prof. Hasselberg that of Lord Rayleigh. On Monday Sir William Ramsay delivered a lecture on argon and helium at the Academy of Sciences, and King Oscar gave a dinner party to the prize winners. On Tuesday Lord Rayleigh delivered a lecture at the academy on the density of gases. Both lectures were highly appreciated and greatly applauded. It is announced that Lord Rayleigh proposes to present to Cambridge University the value of the Nobel prize for physics awarded to him.

SIR NORMAN LOCKYER, K.C.B., F.R.S., has been elected a corresponding member of the Imperial Academy of Sciences at St. Petersburg.

THE Lavoisier gold medal, which has been awarded by the French Academy of Sciences to Sir James Dewar, F.R.S., for his researches on the liquefaction of gases, was founded in 1900, to be given, without distinction of nationality, at such times as the French Academy should elect in recognition of eminent services rendered to chemistry by scientific men. The present is the first occasion on which the medal has been awarded to a British man of science.

THE Wislicenus memorial lecture will be delivered before the Chemical Society by Prof. W. H. Perkin, F.R.S., on Wednesday, January 25, at 8.30 p.m.

MR. A. SILVA WHITE, formerly secretary to the Royal Scottish Geographical Society, and editor of the *Scottish Geographical Magazine*, has been appointed assistant secretary of the British Association, and has already taken up the duties of the post.

PROF. BOYCE, of Liverpool University, has proposed to the Liverpool Chamber of Commerce a scheme for the establishment of a commercial museum and bureau of scientific information. The object is to correlate the various scientific forces in the city in order to utilise them for commercial advantage. The scheme has been referred to a committee of the Chamber of Commerce.

ON the invitation of the director, Dr. J. J. Dobbie, F.R.S., and Mrs. Dobbie, a large and representative gathering assembled in the Royal Scottish Museum, Edinburgh, on Monday evening, December 12, to celebrate the jubilee of the museum. The museum embraces three departments—natural history, art and ethnography, and technology, under their respective keepers, Dr. Traquair, F.R.S., Mr. D. J. Vallance, and Dr. Alex. Galt. In the natural history department the collection of fossil fish is one of the most important in the world. Other special features of this department are the hall of British zoology and the zoological type collection, the aim of the latter being to illustrate the bearing of comparative anatomy on the classification of the animal kingdom. The ethnographical collection is one of the most extensive of its kind, and contains many specimens brought home by explorers of the end of the eighteenth and early part of the nineteenth centuries. The technological department contains a large and fine collection of machine and engineering models, most of them made in the museum workshops, together with mining and metallurgical specimens and models. There is also a large collection of economic botany attached to this department. The collections of H.M. Geological Survey of Scotland are housed in the museum, and with these is associated the Heddle-Dudgeon collection of Scottish minerals, which has been described as the finest collection of the minerals of any one country in existence. The museum is supported by a Parliamentary grant, and is under the Scotch Education Department, which was represented at the conversazione by Sir Henry Craik, K.C.B., and Mr. Macdonald, assistant secretary.

A MEETING was held in the geological lecture theatre of the Owens College, Manchester, on December 8, at which it was resolved to establish a Manchester University Geologists' Association. The object of the association is to afford a centre of social reunion for the discussion of geological subjects. Prof. Boyd Dawkins was elected president, Mr. B. Hobson and Mr. Winstanley vice-presidents, Mr. W. J. Hall secretary, and Mr. O. B. Leigh treasurer.

A SHORT time ago Dr. Doyen claimed to have discovered the microbe of cancer, and to have prepared with it a curative serum for the disease. A committee was appointed to investigate Dr. Doyen's claims (see NATURE, October 27, p. 631), and, according to the daily Press, has now reported favourably on them. The *Standard's* correspondent telegraphs, however (December 14), that the committee has not yet arrived at any conclusion.

ON the recent retirement of Sir William Macgregor from the Governorship of Lagos, the Liverpool School of Tropical Medicine decided to mark its appreciation of his valuable services to the cause of health and sanitation by raising a fund, to which Sir Alfred Jones contributed 500*l*. and Mr. John Holt 200*l*. It has been decided to expend this fund on two medical expeditions to the west coast of Africa, one in charge of Prof. Boyce, who, with Dr. A. Evans and Dr. H. H. Clarke, sailed from the Mersey on Wednesday, the other under Colonel Giles. These expeditions will