

News and Views

The New Spectrograph Objective for the 200-inch Reflector

THE new $f/0.36$ spectrographic object-glass referred to in Dr. G. E. Hale's article in our Supplement this week on the Astrophysical Observatory of the California Institute of Technology was designed primarily with the object of increasing the range within which distant nebulae can be investigated by spectrographic methods. The attention of the British Scientific Instrument Research Association was directed to the need for such a lens as the result of a conversation between Dr. Hale and Sir Herbert Jackson, who was at that time Director of Research of the Association. Spectra obtained with the $f/0.59$ lens developed by Dr. W. B. Rayton had indicated that the apparent velocities of recession of the more remote nebulae increase with increased distance of the nebulae. This had been verified by observations on nebulae so remote that satisfactory exposures were obtainable only with the greatest difficulty; but in view of the important implications of these results it was urgently desired to extend the range of investigation to the utmost possible limit. It was obvious that, if any large increase of range were to be obtained, the new spectrographic object-glass would need to be much more 'rapid' than the Rayton lens, that is, the 'focal-ratio' aperture would have to be considerably greater than $f/0.59$. To obtain any large increase of aperture, an 'immersion-type' of lens would be needed, that is, a lens to be used in immersion contact with the photographic film or plate on which the spectrum was to be photographed. With such a lens it appeared probable that a 'numerical aperture' of 1.4 (equivalent to $f/0.35$) should be obtainable, and consideration was given, therefore, to the problems which would arise in designing, constructing and using a lens of this type.

THE design eventually developed was for a system of aperture $f/0.36$, to be used in immersion contact with the coated side of a flat photographic plate and giving, when used with the appropriate collimator and prism system, sharp images of spectral lines over the range 3600–5000 Å. The capabilities of the system were communicated to Dr. Hale, who immediately ordered a lens to this design; a collimator and prism system, suitable for use with the lens, were ordered at the same time. These various items were made and supplied by the members of the British Scientific Instrument Research Association mentioned in Dr. Hale's article. The complete system was examined by the Association before it was dispatched to Mt. Wilson. Tests carried out at Mt. Wilson, with the system erected on the 100-inch telescope, have shown that it enables satisfactory exposures to be given in less than one third of the time required for similar exposures with the Rayton lens. It is thus possible to obtain, during a single night, photographs of nebular spectra which previously had necessitated exposures extending over

two or three nights in succession. It had been hoped that the system would very nearly double the range within which the more remote nebulae can be studied spectrographically with the 100-inch telescope. This hope has not been realised up to the present, owing to the brightness of the sky-background at Mt. Wilson; the lens has, however, already proved of very great value in other types of astronomical investigations, and should come into its full sphere of usefulness at Mt. Palomar when the 200-inch telescope is completed.

The British Scientific Instrument Research Association

THE British Scientific Instrument Research Association was established on May 23, 1918, and was the second research association incorporated by Board of Trade licence, under the Department of Scientific and Industrial Research, the first of these associations—the British Photographic Research Association—having received its licence a few days earlier. It will be remembered that, in the year 1917, Parliament allocated a sum of one million pounds for the promotion of industrial research, and that a scheme was drawn up for the establishment of research associations connected with various industries, each of which was to receive for five years a grant on a fifty-fifty basis in aid of its expenses. The first Director of Research of the British Scientific Instrument Research Association was Sir Herbert Jackson, who retired in 1933; and the first Secretary, Mr. J. W. Williamson, who is to retire on March 31 next.

ON January 29 a presentation was made by the council and members of the Association to Mr. Williamson in recognition of the valuable services which he has rendered to the Association since he became the secretary in 1918. Mr. Williamson has contributed largely to the successful organisation and development of the Association, and has also rendered able service, in a variety of ways, to the Research Association scheme as a whole. In making the presentation, Dr. W. H. Eccles, chairman of the Association, specially mentioned the cordial relationships which have existed between Mr. Williamson and all with whom he has come into contact. Sir Herbert Jackson paid high tribute to Mr. Williamson's organising abilities, legal knowledge, foresight and administrative experience; and in a letter, Mr. H. T. Tizard similarly expressed high appreciation of his work and influence. Mr. Williamson, in thanking the Council and members of the Association for their appreciative remarks, and for their gift, expressed his personal gratitude to all with whom he had come in contact in connexion with his work for the Association: the congenial relationships which he had enjoyed during the whole of his eighteen years as secretary, and which he had so much valued, would be among his most pleasant memories during his retirement.