

say that these pictures are worthy of him. They consist of whole plate views of each of the five large figures, and one of the same size of the complete memorial. Notwithstanding the difficulty of perfectly rendering bronze figures, owing to their non-actinic colour, these are soft, brilliant, round, and perfectly well modelled, doing justice to the simple grandeur of Mr. Durham's noble sculptures.

PHOTOGRAPHS TAKEN AT SANDRINGHAM. BY THE LONDON STEREOSCOPIC AND PHOTOGRAPHIC COMPANY.

To make good pictures out of unpicturesque subjects is a task more difficult than making bricks without straw. All that could be done for Sandringham in the shape of good photography and well chosen positions, has been done, however, by Mr. England and the staff of operators sent down by the Stereoscopic Company. The result is some really pleasing pictures of the hall and grounds, and surrounding neighbourhood, both in stereoscopic and 10 by 8 pictures. In the production of portraits the task was easier. The Princess, always graceful and charming—the Prince, always pleasant, easy, and a gentleman, make good pictures in any style; and of the score of different positions, &c., produced by the company, there is not one bad. A group of the Prince and Princess, the latter sitting on a rustic garden-seat, and the Prince leaning against it, forms at once as pleasing a picture and satisfactory likenesses as have yet been produced. This picture is published both in stereoscopic size and as a vignettted 10 by 8 picture for framing. All the portraits are good, but the group is a gem. We perceive that the company has recently devoted some attention to the production of neat, cheap frames for photographs, which are worth the attention of photographers.

PRIZE PICTURES. BY MEMBERS OF THE AMATEUR PHOTOGRAPHIC ASSOCIATION.

All the prize pictures of the Amateur Association are this year good, most of them possessing pictorial as well as photographic merit. If we were disposed to be hypercritical, we should again be inclined to question on what ground the degrees of merit were decided, as there is an equality of excellence in all the pictures, which renders it difficult to say whether those taking the fourth prize are not in all respects equal to those taking the first. The "Hall of Columns," at Carnac, by Mr. Remington, for instance, which takes a fourth prize, is, of its kind, perfect; and "Hill and Tank," an Indian picture, by Lieut. Impey, also taking a fourth prize, would be, were it not for its stopped-out sky, perhaps the most meritorious picture of all. Mr. A. Henderson's instantaneous photo, "The Mountain Maid," a charming whole-plate vignettted picture of a steamer on a Canadian lake, with water, distant foliage, and clouds, all well made out, takes a third prize. The second prize is awarded to a pair of whole-plate subject pictures, "Going a Milking," and "Been a Milking," in which skilful use is made of a few real rustic accessories, giving *vraisemblance* to the general effect produced by a painted background. The composition is good, and the photography excellent; but we should have liked to have seen less consciousness in the model, and different scenery, or the same scene from a different point, instead of the same painted background in the same position in each. The two first prizes are carried off by Mr. Baynham Jones and Major Gresley; the first, for a picture containing much poetry, although not a perfect photograph, called "A Misty Morning;" and the second, for a pair of excellent photographs entitled "Sunshine" and "Shade:" both the photographs are good; but there is not sufficient of the characteristics of sunshine and shade in the pictures to justify the titles. We think, altogether, the pictures are an advance upon those of last year.

SPECTRA OF THE STARS.*

At the meeting of the Royal Astronomical Society held in April last, the Astronomer Royal gave an oral account, illustrated by drawings, of the apparatus which had been prepared at the Royal Observatory, Greenwich, for the observation of the spectra of stars, and of some of the principal results obtained. In the drawing below, the first

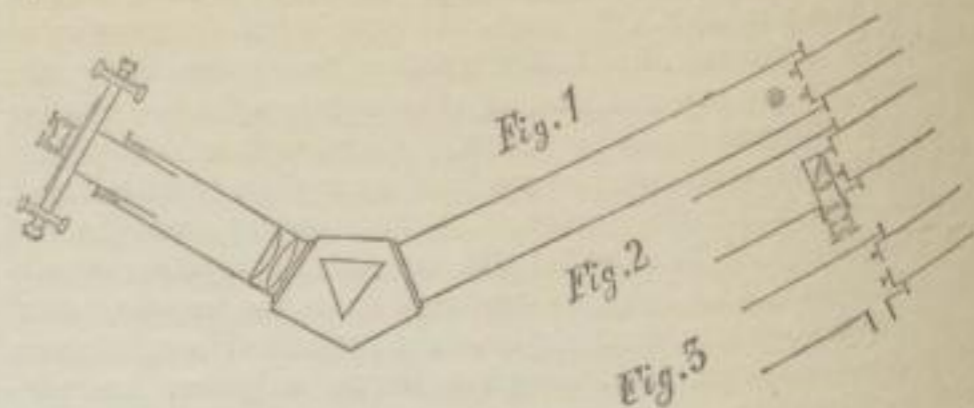


figure represents the entire apparatus, in section; the second and third figures represent the right-hand portion of the apparatus in a section through the axis of the long tube, but at right angles to the former section.

In Fig. 1 the smaller tube at the right hand is for insertion in the socket upon the breech-piece of the telescope of the great equatorial. To carry the apparatus steadily (great accuracy of position is not needed), a temporary frame is screwed to the sides of the telescope tube. The right-hand tube is thrust into the socket so far that the image of the star is formed in the moderately small hole in the inner end of that smaller tube. The pencil of light from the object-glass, which has converged to form the image of the star, then diverges and falls in a wide and divergent state upon the prism; after emergence it is received on a combination of lenses, which causes the pencils for the different colours to converge. It is seen thus that a spectrum may be formed at the place of the micrometer; it is necessary now to explain how breadth is given to the spectrum.

For this purpose the prism is not placed in the position of minimum deviation, or the position in which the angles of incidence and emergence are equal. It is so inclined that the angle of emergence is greater than the angle of incidence. With this arrangement, the change in the degree of divergence of the extreme rays of the pencil is different as regards (on the one hand) rays in the upper and lower parts of the pencil, or in the plane of the paper, and (on the other hand) rays in the plane perpendicular to the paper. The difference is such that, when after passing through the lenses the former have converged so as to form a pure spectrum at the place of the micrometer, the latter have passed convergence, and therefore the spectrum has breadth. The position of the prism, which gave a convenient breadth to the spectrum, was determined by trial. It is necessary to remark that the lenses must not be achromatic; they are, in fact, made of dispersive flint glass; if achromatic, the spectrum would have been formed in a plane inclined to the plane of the micrometer. The whole of these peculiarities were calculated numerically on geometrical theory before the construction was attempted.

This principle may be regarded at present as experimental. In simplicity of construction it is much superior to the principle of causing the pencils which pass through the prism to consist of parallel rays, which requires the use of two achromatic object-glasses and one cylindrical lens; but it is not yet certain whether or not it defines the spectral lines with equal sharpness.

It is necessary now to explain how reference is made to the lines of the solar spectrum. In fig. 1, near the right-hand extremity of the large tube, a small circle may be seen. This is a view (not properly in section) of a small socket, which in fig. 3, lower side, may be seen empty, and

* Monthly Notices of the Royal Astronomical Society.