

The meteor was evidently a Perseid, and had a radiant at  $36^\circ + 57^\circ$ . It was first seen when at a height of 95 miles above Oxford, and disappeared when 61 miles above Devizes. Its real length of path was 53 miles, and the earth point is indicated in the English Channel about 10 miles south of Lyme Regis, Dorsetshire.

On August 11, 11h. 43m., Prof. Herschel mapped a small bolide, rivalling Jupiter in brightness, and traversing with moderate speed a course of  $15^\circ$  from  $229^\circ + 59^\circ$  to  $225^\circ + 44^\circ$ , or from near  $\iota$  Draconis to the head of Boötes. Duration of flight 1.5 sec.; the nucleus was evenly bright all the way, and it left a streak for 3 secs. Mr. Corder registered the same meteor, and gives the time as 11h. 42m., magnitude equal to Jupiter, and path as  $60^\circ + 62\frac{1}{2}^\circ$  to  $70^\circ + 64^\circ$  in Camelopardus.

This object was also a Perseid, the radiant being at  $32^\circ + 52^\circ$  near the cluster at  $\chi$  Persei. The meteor at its first appearance was 75 miles high above a point 5 miles N. of Stratford-on-Avon, and at its disappearance 52 miles high over a place 5 miles W.N.W. of Great Malvern. Its real length of path was 34 miles, and earth point 6 miles S.E. of Aberdare.

*Red Spot on Jupiter.*—When twilight became too strong for comet-seeking on the morning of August 25 last, I turned my 10-inch reflector on Jupiter and saw the red spot, indefinitely, near its central transit. The planet had only just risen above the tops of some houses in this locality, and the telescopic image was by no means good, but I estimated the transit of the spot occurred at 4h. 24m. A.M. (August 24, 16h. 24m.), or about 9.4m. after Mr. Marth's zero meridian, System II., so that the longitude of the spot was  $5^\circ.7$ . The shouldering of the great south equatorial belt, east of the spot, was very conspicuous, and afforded an excellent guide to the position of the latter. A few minutes after the transit of the red spot I noticed a large white spot on the north side of the north equatorial belt, passing the central meridian. A power of 312 was used in these observations.

W. F. DENNING.

Bristol, September 7.

#### Curious Optical Phenomenon.

THE following description of an optical phenomenon, and its probable explanation, may be of interest. It will be observed that a similar experience occurring to one not accustomed to making optical experiments would very probably have caused him to believe that he had seen a ghost. It is therefore of importance psychologically.

The facts observed were as follows:—At about 1 A.M., August 26, I went to my bedroom; to get to it I had to pass through a small room which I used as a study. On entering it, though it was dark, and I had no lamp, the small room seemed brightly illuminated, about as bright as an 8 c.p. lamp would make it, apparently. To one side of a window in the room I saw a man standing, whom I recognised to be myself. The whole impression was very vivid and clear.

So far nothing was observed beyond what is described in the ordinary ghost story. I was much occupied with the consideration of a problem at which I had been working, and did not at first grasp the full signification of what I saw. On turning my head, the figure disappeared, but on looking towards the window, through which a very faint line came, the image reappeared. I then noticed that it was apparently standing in a position occupied, as I knew, by a large table. On more close examination, without, however, moving from the spot where I was standing, I saw that it had changed, and that it did not appear to have features; then it appeared to be flat against the wall, and I finally recognised it as an after-image of a shadow. On my first seeing it, however, it did not have this appearance to me, and I had evidently mentally supplied the features as one often does to the face of a friend who is seen at a distance which is really too great to admit of actual recognition.

I then got the impression of having seen the shadow before, and on considering the matter a few seconds, remembered that it was just before I had started for my room. I had been working in another room, endeavouring to solve a physical problem for four or five hours, and for about half an hour, or possibly more, had been steadily looking at a lamp (a habit of mine when abstracted); I then got up, leaving the lamp lit, and went out on my way to my bed-room as mentioned above. On going out of the door my shadow was thrown by the lamp on the wall just to the right of the door. The passages were entirely dark, and it was not until I entered the room used as a study,

that the faint light coming through the window and falling on the same spot of the retina that was previously occupied by the image of the dark doorway, stimulated the after-image.

I may say that my health was of the best, but that I had been smoking heavily for a few days previously, and the fact had begun to force itself upon me.

I would especially remark upon the apparent brightness of the apparition. I had never seen an after-image so bright. On going back to the room where the lamp was, I proved that the appearance of the shadow thrown as I went out of the room corresponded with that of the image seen, minus of course the features and colour, which had been supplied by the imagination.

In speaking of optical phenomena, I would say that an easy way of showing that the colours seen in the colour-top are due to lack of accommodation, is by taking a piece of red paper or cloth, and turning the top till the inner or outer line matches it exactly. Then, without moving or changing the speed of the top, place before the eye a convex glass. The colour on the top will disappear, but that of the cloth will of course remain. Similar experiments to those observed with the top can be observed by drawing dark lines on a piece of glass, and waving dark and white paper behind them.

R. A. F.

#### A Remarkable Flight of Birds.

THE forms of birds flying at a great height and crossing the solar disc, as described by Mr. Bray in your issue of August 29, have been rather frequently seen here during the spring and autumn months, and the writer has always attributed such flights to migrating birds on passage. They have usually been noticed while observing the image of the sun projected on a card screen from the eyepiece of a small equatorial telescope; occasionally, however, they have attracted attention at night also, crossing the disc of the moon, upon which their forms are very clearly defined, and with careful focussing (which is very nearly the same as for parallel rays) it has almost been possible to identify the species from the shape of the wings and manner of flight; birds of the swallow tribe, in particular, have been clearly distinguished, and others resembling the thrush, possibly redwings or fieldfares, have been noticed. The direction of flight, according to the writer's experience, is nearly always towards the south in August and September, and the reverse in April.

On August 31, a continuous watch was kept on the moon from 8.50 to 9.35 P.M., using a power of 80 diameters on a reflector of 10 feet focus. Only eight birds were seen, however, four of them slowly crossing from north to south, the other two from west to east (nearly). They were evidently very distant. An estimate of the change of focus required for the apparently nearest bird gave .15 inch. This would imply a distance of 7900 feet from the telescope, and the moon's altitude being about  $14^\circ$  the vertical height of this bird would be  $7900 \times \sin 14^\circ = 1900$  feet (about). Some of the birds, judging from their apparent size, must have been two or three times more distant, and therefore higher in the same proportion.

It would be very interesting to obtain systematic observations of such flights of birds from various localities during the migrating seasons. Possessors of telescopes would find these observations a good exercise in that kind of patience or endurance which is so necessary in observing, for instance, a so-called meteor shower at its maximum!

The writer would be glad to receive notes on the subject from those of your readers who may care to watch for birds during the autumn. Estimates of the angle subtended by the spread wings would perhaps give the most reliable means of ascertaining the height of the birds, and their direction of flight can easily be obtained by reference to the diurnal motion of the sun or moon. It is hoped that by collecting data of this kind some new facts may be learned regarding the mysterious habits of our bird visitors.

J. EVERSLED.

Kenley, Surrey.

#### THE WOBURN EXPERIMENTAL FRUIT FARM.

ON June 12 last a small party of those interested in agriculture and horticulture, including Mr. Herbert Gardner, Sir John Thorold, Prof. Armstrong, Prof. Warington, Dr. Voelcker, Mr. Charles Howard, Mr.