

Germany purchased abnormally from Russia during the first seven months of 1914 the fact would probably have been reflected in an increase in the price of manganese-ore during the year. As a matter of fact, the price per unit of manganese-ore fell steadily from a maximum of 12 to 12½ pence in January, 1913, to 9½ to 9½ pence in July, 1914.

From what precedes it seems justifiable to conclude (a) that on the outbreak of war the Teutonic Powers had no great accumulated stocks of manganese-ore, perhaps a maximum of 200,000 tons; (b) that, assuming war conditions necessitate a maintenance of the iron and steel industries of those two countries at a peace standard, about 600,000 tons of ore a year must be obtained from fresh sources to replace imports in time of peace; (c) allowing that the Teutonic Powers might succeed in increasing their internal production by 100,000 tons and obtain 50,000 tons of manganese-ore from Turkey, if the Allied fleets could prevent all manganese-ore from outside from reaching Germany and Austria these countries would be faced with a shortage of 250,000 tons of manganese-ore in the first year of war, and with a shortage of 450,000 tons per year afterwards, increased to 500,000 tons per annum once the Dardanelles are forced.

The Germans will doubtless find means of dispensing with the use of manganese-ore as much as possible, and they may devise methods of utilising the manganese silicate, rhodonite, of which they appear to possess a considerable quantity; but it seems inevitable that the shortage of manganese-ore, once it is felt, will hamper seriously the German iron and steel industries.

It appears therefore to be of the utmost importance that every effort should be made by the Allied fleets to prevent smuggling of manganese-ore (or ferro-manganese and spiegeleisen) into Germany and Austria, either direct or through neutral ports. It is to be noted that of the small countries adjoining the enemy countries the only one manufacturing iron and steel is Sweden, which does not show either manganese-ore, ferro-manganese, or spiegeleisen, amongst her imports in normal years.

L. LEIGH FERMOR.

Calcutta, September 2.

Jupiter's Two Principal Markings.

At intervals during the work of a comparison of stellar magnitudes, the 26-in. reflector has been turned on Jupiter, in order to determine the present rotation period of the various surface currents, and it is hoped that results of some value will be obtained by the end of the present apparition. The following longitudes, based on transit estimates, of the two most important objects on Jupiter, viz., the S. Tropical Disturbance and the Red Spot Hollow, have been determined:—

S. Tropical Disturbance			Red Spot Hollow		
Date 1915	P. end	f. end	Date 1915	P. shoulder	f. shoulder
Sept. 11	... 28°3'	...	Sept. 10	...	260°2'
13	... 25°9'	...	12	... 224°6'	...
20	... 23°5'	...	17	... 224°3'	261°2'
21	...	117°7'	19	... 224°1'	262°8'
26	...	112°8'	27	...	260°2'
28	...	111°6'	29	...	260°2'
30	... 20°4'	110°4'			
Oct. 1	...	109°7'			

The S. Tropical Disturbance is more than 90° in length at the S. equatorial belt, and in point of size forms a wonderful object when centrally on the meridian. Its length is such as to extend nearly from limb to limb. It first appeared as a comparatively small object in the spring of 1901, and although in the meantime it has fluctuated in size considerably, it exhibits no signs of decadence.

When the air is steady, the Red Spot can be seen without difficulty in the 26-in. reflector. It is, how-

ever, well to state that it is now no more distinct than it has been for many years. Displaced towards the f. side of the Hollow, its following end coincides almost with the longitude of the f. shoulder of the Hollow, while its northern contour is nearly in line with the S. edge of the S. equatorial belt. It will be seen from the above longitudes that the length of the Hollow is roughly 38°, a similar dimension having obtained during the last fifteen years.

October 2.

SCRIVEN BOLTON.

The Orionid Meteoric Shower.

THE ensuing return of these meteors will deserve, and probably will repay, observation. The moon will be full on October 23, and will somewhat interfere with the display, but it is rather a long-continued one, and may be favourably witnessed in the mornings from about October 17–21 before sunrise.

From a great many observations made at Bristol, and which I have recently discussed, I believe that the shower extends from the first week in October to the first week in November. I have determined two radiants, as follows, from my collected materials from 1873 to the present time:—

October 3–12—91½°+14½°; 10 meteors.

October 25–November 7—92½°+14°; 18 meteors.

For the intervening period between October 12 and 25 I have a number of radiants of this well-known and annually recurring shower. The two radiants given above are adequately supported by a sufficiency of streaking meteors, and I believe represent genuine positions, but it cannot absolutely be proved that they are based on the flight of true Orionids. Remembering, however, that the radiation is from a fixed point at about 92°+15° for certainly a fortnight near the maximum, I believe I am justified in ascribing a month's activity to the shower. It would be serving a useful purpose if observers watched the display very carefully this year, and ascertained the place of the radiant point accurately between, say, October 15 and 25. The fact of this stationary radiant would then be no longer open to criticism.

W. F. DENNING.

44 Egerton Road, Bristol, October 8.

Visibility of Distant Objects in Warfare.

I WAS much interested in the article on "Visibility of Distant Objects in Warfare" in NATURE of September 30. The question is of vital importance to many who, like myself, spend much of our time in artillery observing stations.

I believe a good deal of misconception exists as to the reasons why the Germans use various-coloured sandbags. It may be that their use is intended to make for invisibility, but I am inclined to think that it is primarily due to their lack of materials for making sandbags. They lack jute, and are consequently forced to make use of the stocks of various-coloured dress materials, in some cases indeed using the uniforms they have taken from the bodies of any men who may have been killed near their trenches. It is interesting to note that the colour most commonly employed in making their latest sandbags is a pinky-red.

In dealing with the question of visibility, it seems to me that the whole tendency in designing uniforms and in making fortifications is to ignore the important consideration of shadow, which Thayer has shown to have such an important bearing on the coloration of animals.

I have hopes that your article may induce some man of science to take the matter up, and perhaps submit his conclusions confidentially to Lord Fisher's Commission.

ARTILLERY OBSERVING OFFICER.

October 6.