

on circular cones, which always touch the incident pencil, and the aperture of which varies continuously with the inclination of the crystal. With a plate of mica, a spot was observed which is situated as if it were the reflected image of the incident ray; but it is doubtful whether we may call it "reflected," because other spots are also seen on the same side of the plate, deviating considerably from the "image." Further experiments in this direction are in progress.

T. TERADA.

Physical Institute, Imperial University, Tokyo,  
March 18.

### Fish-eating Habits of a Spider.

IN a lecture delivered to the Natal Scientific Society on November 22, 1911, the Rev. N. Abraham described the habits of a spider that he had observed catching and eating fishes. An account of the lecture was printed in *The Natal Advertiser* and subsequently reprinted in *The Agricultural Journal of the Union of South Africa*, but, so far as I am aware, these interesting observations have not appeared in any prominent scientific publication.

When Mr. Abraham's lecture was given the spiders had not been determined, but I have since had an opportunity of examining two preserved examples in his possession, and I have determined them as *Thalassius spenceri*, Picard-Cambridge (Proceedings of the Zoological Society, 1898, p. 28).

The following is an extract from the newspaper account:—"In the year 1905 I was living in Greytown, Natal. One day I was catching small fish and aquatic insects for an aquarium. I was using a small net in a shallow stream. I happened to see on the edge of the water a fine spider, which I captured. On reaching home I placed my specimen in a large aquarium, where I had a number of small fish. The spider measured about three inches when its legs were extended; the body is small, but the legs are long. After being on the rockwork of the aquarium for some time, it took up a very interesting position. It rested two legs on a stone, the other six rested on the water, well spread out, the ends of the six legs commanding a definite and well-defined area of water.

"Being busy, I merely took a note of its attitude, and left it to its devices. After a few minutes my servant boy came into my study to say that the spider I had put into the aquarium was eating one of my pet fish. I at once went to see what had happened, and soon saw the spider on top of the rockwork, holding in its grip a beautiful little fish about four times the weight of its captor. For a moment I was startled into a strange surprise. How could this spider, which has no power to swim, catch a lively, quick-swimming fish? I looked at it in wonder, as it seemed to clutch the fish as a cat clutches a mouse. It soon began to devour its catch, and after some time had passed nothing was left of the fish but its backbone. The spider had eaten it as surely as an otter eats its trout.

"I was now anxious to find out how the spider caught the fish. That night, about 11 o'clock, when I had finished my day's work, I sat down by the aquarium to watch the spider, with the hope that I might see how the fisherman caught his fish. The spider had taken up a position on a piece of stone, where the water was not deep, and had thrown out its long legs over the water, upon which their extremities rested, making little depressions on the surface, but not breaking the 'water skin.' The tarsi of two posterior legs firmly held on to a piece of rock just above water-level, the whole of the body was well over the water, the head being in about the centre of

the cordon of legs, and very near to the surface of the water.

"After watching for some little time, I saw a small fish swim towards the stone and pass under the outstretched legs of the spider. The spider made a swift and sudden plunge. Its long legs, head, and body went entirely under the water, the legs were thrown round the fish with wonderful rapidity, and in a moment the powerful fangs were piercing the body of the fish. The spider at once brought its catch to the rocks, and began without delay to eat it. Slowly, but surely, the fish began to disappear, and after the lapse of some time the repast was over."

Recently the Rev. Father Pascalis Boneberg, of the Marianhill Monastery, Natal, has added to Mr. Abraham's observations. Father Boneberg has seen examples of this same spider catching and devouring tadpoles of the toad *Bufo carens*, and adults of the little frog *Rappia marmorata*. It is his intention, I understand, to communicate an account of his observations to a German scientific publication shortly.

That the observations of both these gentlemen are based upon the same species, *Thalassius spenceri*, I have no doubt, for Father Boneberg allowed me to examine an adult male and female, and two immature examples, of his spider. The two latter specimens he kindly presented to the Durban Museum.

E. C. CHUBB.

Durban Museum, Natal, March 15.

### A Detonating Daylight Fireball.

THE following may be of interest to some of your readers. On the morning of February 10, at about 6 a.m., the manager and some of the employees of a sheep farm which is situated on the Coyle River, about seventy miles from its mouth, were working close to the settlement when they were suddenly startled by an almost deafening noise which resembled the explosion of a huge gun or a violent peal of thunder close at hand. This was followed by a humming sound, such as would be produced by a motor-car, which lasted for about twenty seconds, after which interval there was another explosion, less violent than the first, which in turn was followed by further hummings and explosions, the latter gradually dying away in about a minute or so.

These men saw nothing to account for the sound, but as the settlement is situated at the foot of a high hill, which rises to the south, it was their impression that the noise came from over the top of this hill. Later in the day Mr. Welsh, the manager referred to, from whom I had most of the facts, met some carters, who told him that they actually saw the object, that it was about twenty-five miles further down along the same river on the top of the high pampa at the same hour, that it resembled a huge ball of fire with a long tail behind, and passed rapidly from east to west; they noticed no explosion.

These facts were corroborated by a sheep farmer (Mr. Ness), who lives about twenty-eight miles above Mr. Welsh, on the same river. Mr. Ness told me that he did not see the object, but that the sound of the explosion shook all the windows in his house and was followed by the same humming sound and secondary shocks.

The servant of a neighbour in this town also informs me that on the same morning at about the same hour she heard what she considered a series of bombs exploding. Now Mr. Ness's house is upwards of ninety miles from here, and as it shook his windows it would probably have been heard another sixty miles further on; this would lead one to believe that the explosions were distinctly audible over an area

of at least 150 miles in diameter, and were no doubt produced by a huge exploding fireball. The morning in question was clear and bright. E. G. FENTON.

Rio Gallegos, Patagonia, February 12.

#### On the Gain of Definition obtained by Moving a Telescope.

Is not the case mentioned by M. E. J. Gheury in NATURE of March 27 (p. 86) but a special case of the familiar fact that an object which is so like its background as to be invisible when at rest is commonly visible when it moves? In this case, as the telescope moved, the signal in its field of view was to the eye fixed to its eyepiece an object moving against the background of misty sky, which it so nearly resembled as to be invisible when at rest. Is not the

#### NORTHERN METHODS OF BURIAL IN THE IRON AGE.

M. R. SCHETELIG'S excellent memoir<sup>1</sup> describes the recent more precise investigations which correct and elucidate older work. Relics other than from graves are insignificant, and the nominal restriction to Vestland scarcely lessens the interest, for local discoveries are throughout compared with those in other provinces and countries. Neither a *catalogue raisonné* of antiquities, nor a general account of the evolution of Norwegian culture during the Iron Age, the volume serves as a foundation for works of those

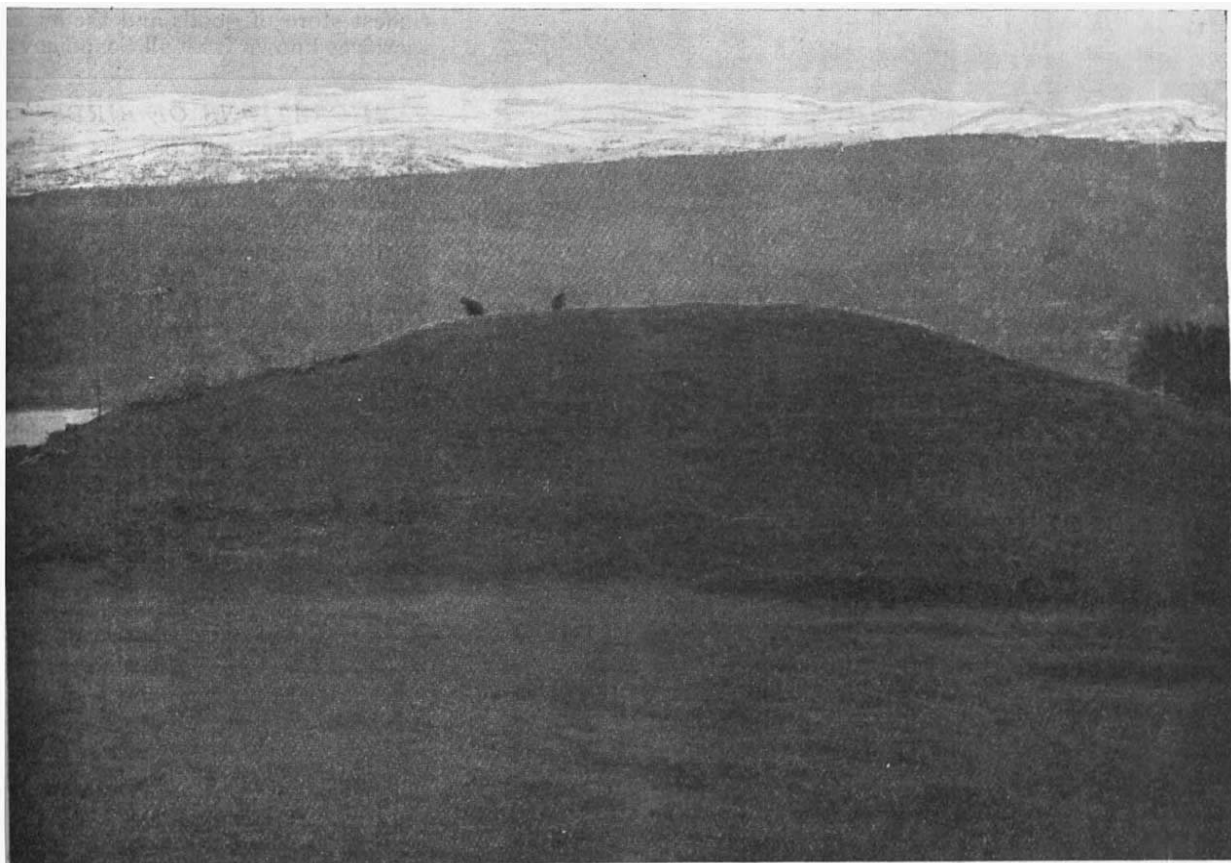


FIG. 1.—The Byrkje grave-mound at the beginning of the excavation. From "Vestlandske Graver fra Jernalderen." Bergens Museums Skrifter.

explanation as follows? Visibility of the object, and in particular of its outline, depends on *contrast* between it and its background. There is commonly *some* contrast, but often so slight as not to attract attention when the object is at rest. When, however, the object moves, the brain receives successive impressions of contrast as the image of the object falls on one part of the retina after another. Thus the brain receives a *cumulative impression of contrast* between the object and the background, and the object becomes "visible."

If this be not, as perhaps it is not, a perfect explanation of this familiar fact, there are probably many others beside myself who will be glad to know what the correct explanation is.

Candahar, Reigate.

G. W. BUTLER.

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two different classes. The objective account of the graves themselves, and of the disposition therein of the varied remains, is its endeavour; and its general conclusions relate mainly to the development of burial methods.

The third and fourth centuries A.D. are, in Vestland as elsewhere, those most influenced by Roman culture, while during the fifth and sixth centuries more original lines were followed. During the third century, however, a greater change occurred than about the year 400; it was

<sup>1</sup> "Bergens Museums Skrifter." Ny Række. Bd. ii. No. 1. Vestlandske Graver fra Jernalderen. By Haakon Schetelig. Pp. iii+242. (Bergen: A/S John Griegs Boktrykkeri, 1912.)