

*Waves and Rays in Physics:* DORIS W. HERING.

The author pointed out the extent to which waves or rays have dominated in explaining the transmission of a disturbance through space, as many as seven different kinds of waves having been employed, and no less than twenty-one different kinds of rays. The most fruitful generalization was Fourier's analysis of wave motion in his "Théorie Analytique de la Chaleur"; the boldest contention was that of Fresnel in advocating transverse vibration to produce waves of light; the most recent and comprehensive generalization was Maxwell's electromagnetic theory of light. The recent great increase in the number and variety of "rays" has been attended by a great deal of charlatanism.

*Tool Steel-making in Styria:* R. F. BÖHLER.

Reviewed the development of Styrian steel trade from prehistoric and Roman times up to our own days. The paper emphasized a number of special features characteristic of Styrian steel which are so many reasons for its superiority: (1) Crucibles used but once, (2) extreme purity of ores, (3) extensive or exclusive use of charcoal, (4) special skill of workmen in hammer- and heat-treatment.

The works, founded 1446, are now decidedly up-to-date; have pyrometric control; electric melting and hardening furnaces; latest physical testing methods, metallography.

As a consequence extensive use of Styrian steel in the five continents, for tools, rifles, shells, etc., also field guns, motor cars. Hundreds of tons of high-speed steel shipped to the United States yearly.

*Electrolysis of Silico-Fluoride Solutions:* Dr. E. F. KERN.

The author first of all took up the preparation of the electrolytes, current density, etc., and showed numerous specimens including metallic surfaces of lead, nickel, iron, copper and silver deposited from silico-fluoride and other solutions for comparison. The method on a commercial scale for the purification and desilverization of lead is employed at Trail, B. C., and elsewhere.

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## DISCUSSION AND CORRESPONDENCE

## A BRITTLE-STAR NEW TO THE WOODS HOLE REGION

THROUGH the kindness of Mr. George M. Gray, the well-known collector of the Marine Biological Laboratory at Woods Hole, Mass., I am enabled to make an interesting addition to the list of echinoderms known from the Woods Hole region. A single specimen of a brittle-star was dug out of the mud between Ram and Devil's Foot Islands in August, 1907. It was taken to the laboratory alive and in good condition, but in the course of a few hours it shed its disk, leaving only the mouth parts attached to the arms. The disk, as well as the remainder of the animal, was preserved in formalin and the specimen was subsequently sent to me by Mr. Gray for identification. There is little doubt that it is an excellent example of *Amphioplus abdita* (Verrill), a species previously known only from Long Island Sound. It is recorded from near New Haven and from Thimble Islands, by Professor Verrill, and there are specimens in the Museum of Comparative Zoology from Noank, Conn. The Woods Hole specimen measures about 6.5 mm. across the disk, and the arms are between 80 and 90 mm. in length. It differs from Professor Verrill's very complete description, and also from the specimens in the Museum of Comparative Zoology, in three important particulars: (1) the arms are noticeably shorter in proportion to the diameter of the disk; (2) the scales of the disc are coarser and the six primary plates at the center are conspicuous; (3) the color is uniformly gray instead of variegated or yellowish-brown. It is greatly to be hoped that further search will bring to light more specimens at Woods Hole, of this mud-loving species, for it will be interesting to see whether the above-mentioned peculiarities are at all constant. It would also be of great interest to investigate the cause, method and consequence of disk-shedding, a habit known to be frequent in the family to which *Amphioplus* belongs, but concerning which we know almost nothing.

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November 14, 1907