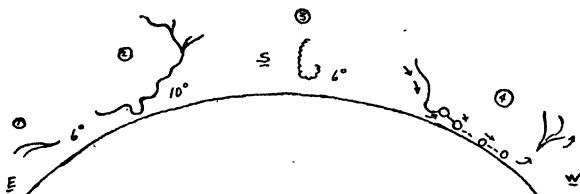


OBSERVATIONS OF LIGHTNING

I AM enclosing some rough drawings of lightning as seen by me last night at Chatham, N. J. I don't imagine these are especially significant, but it was the second time in my life that I have seen ball- or chain-lightning, and the first time I ever saw any lightning as indicated in Fig. 3. This last was very snake-like,



FIGS. 1, 2 and 3.—All cloud phenomena. Fig. 4 ball or chain. Dashes indicate progress of single ball, which apparently came to earth as (O—O) a 2-ball chain, and then was dissipated in the direction of arrow in form indicated—a kind of flame. Fig. 3 is a type I have never before seen. I made these drawings at the time, during 5 storms lasting, with intervals of an average of 5 minutes, from 6 P. M. until 3:30 A. M., July 9–10, 1930. In Fig. 2 note the U-shaped discharge. The area was as above indicated: East, South, and West. There were several zenith flashes of great intensity, the general color being white, and quite blinding.

or perhaps worm-like; I wish I could have photographed them, but drew them immediately, which was the best I could do. In this connection, one discharge, so blinding that it left everything positively black, obligingly wrote itself in black by means of vision persistency, and so I was able to put it down.

I note that Mr. Allard, in *The Scientific Monthly*, is doubtful as to the actual appearance of certain discharges, not trusting his eye. Why couldn't he have photographed the same flash that he saw, and then compared the picture with his visual impression?

My vision is super-excellent for lightning, a comparison of photographs with visual remembrance perfectly coinciding, and I am quite sure that Fig. 3 is a faithful reproduction. The U-shaped one may be common, for aught I know, but I never remember seeing anything exactly like it. These five storms were quite distinct, and not recurrent, an average interval of five minutes spacing them from about

6:00 P. M. July 9 to 3:30 A. M. July 10. The quality of the thunder referred to by Mr. Allard changed from what I may characterize as heavy paper-tearing to dull, heavy, jarring echoes which made a distinct impact on windows and doors. I had the radio turned on—a very sensitive set—and got the discharges instantly, *i.e.*, evidently at the exact time of the explosions, the actual sound not reaching me until some time after the radio sound. I estimated the average distance, with one exception, at $2\frac{1}{2}$ miles, and it was easy to prove that the radio emanations were those of the actual discharge. One or two flashes were so swift that I was virtually unable to see them, although looking directly at them, seeing them only by persistence of vision, as above noted.

The one exception above mentioned came after a five-minute interval of absolute quiet (rather exceptional), and struck a tree 50 ft. distant, cutting it directly in half, laterally, which I believe is also unusual. The sound of course was no more than a whiplash.

HAMILTON CRAIGIE

JULY 10, 1930

COCOS AND VALENCY

I WISH to call attention to two statements in the August 1 issue of *SCIENCE*. In reference to the generic name *Cocos*, Murray's dictionary, which devotes much space to a discussion of the source of the word, states that Spanish and Portuguese authors are unanimous in the opinion that it is derived from the Spanish noun *coco*, "grin," on account of the face-like markings at the base of the fruit.

I wish, however, specially to protest against the inference to be derived from the statement on page 101 (Professor Fajans' lecture) that the sole honor of the suggestion of the doctrine of valency is due to Kekulé. It is clear that Frankland in his paper presented to the Royal Society in 1852, detailing the discovery of the organo-metallic bodies, embodied such statements as entitle him to the honor of setting the theory of valency in notice. It is also worthy of note that Couper in 1858 first set forth (in *C. r.*, 46: 1157, 1858) the use of bonds connecting atoms in the manner of our now familiar structural formulas.

HENRY LEFFMANN

SCIENTIFIC BOOKS

Die Paläobotanischen Untersuchungsmethoden. DR. RICHARD KRÄUSEL. Jena, Verlag von Gustav Fischer, 1929.

AN important feature of post-bellum developments in Germany is the issue of a number of admirable handbooks and general works which are usually con-

structed with great thoroughness. A recent addition to this group of works is a small but important volume by Professor Richard Kräusel, of the University of Frankfurt am Main. In it he treats in a thoroughly satisfactory way of paleobotanical methods of investigation. A work of this sort is obviously much needed, as the literature on the subject is very