The Popular Science News
AND
BOSTON JOURNAL OF CHEMISTRY.

VOLUME XXIII. BOSTON, JANUARY, 1889. NUMBER 1.

CONTENTS.

Familiar Science.

SCIENTIFIC RECREATIONS.

SOME of our readers may have seen the distorted drawings which only show their proper proportions when reflected in cylindrical or

Fig. 2.

conical mirrors. The accompanying illustration (Fig. 1) does not require any mirror to view it in, but it is only necessary to roll it up in a conical form so that the lines A and B shall be in contact. Then look steadily at the point of the cone and the apparently shapeless drawing will be transformed into a portrait of M. CHEVREUL, (Fig. 2,) the eminent and venerable French chemist, now in his one hundred and third year. The portrait will be seen with greater ease if one eye is kept closed at first.

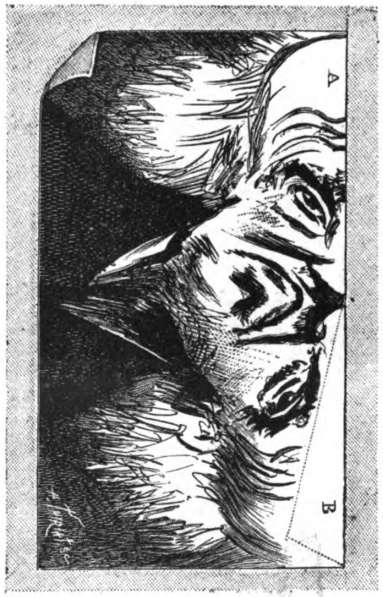

Fig. 1.

This and similar portraits do not require any especial geometrical knowledge to produce, but are simply made by rolling up a piece of paper into the conical form over a piece of wood cut to the proper shape, holding it before the eye in the proper position, and drawing the portrait or design directly upon it. The lines will be properly distorted in the process of drawing without any care on the part of the artist, and any one possessing the necessary skill for drawing an ordinary portrait can, with a little practice, produce distorted ones equally as good as the example given above.

The magic chain (Fig. 3) is a French toy and depends upon an optical illusion. Fig. 2 shows the construction of the chain, which may be of any convenient length, and Fig. 1, the way it is held in performing the experiment. The free ring, A, is held in one hand, and one of the rings, B, in the other. If the ring A is then dropped or thrown downwards with a quick movement, it will appear to drop entirely down through the chain and hang freely at the bottom. This, of course, is impossible, as it is connected with the ring B, but the

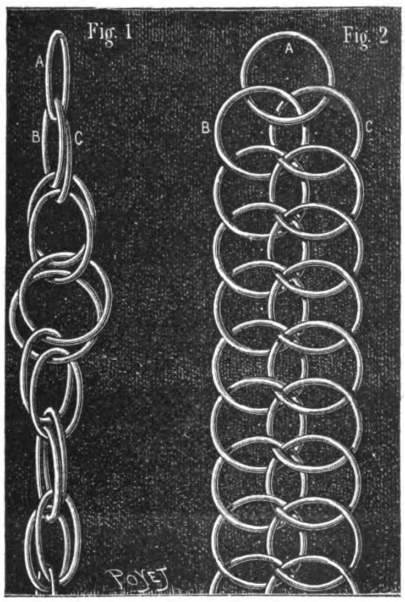

Fig. 3.

apparent movement is due to the successive backward and forward movement of each separate ring in the chain successively, which takes place so quickly that the eye cannot follow it, and it appears as if a single ring was passing through the links of the chain. It is in fact a true wave motion, and is an excellent and simple illustration of the fact that in a wave there is no actual progressive movement of the particles themselves, but only a vibratory movement, and that while the motion is transmitted, the particles of the medium in which it takes place do not change their position.

We are indebted to *La Nature* for the engravings illustrating this article.

A GIGANTIC FOSSIL TORTOISE.

THE accompanying illustration from *La Nature* represents an immense fossil tortoise (one-twelfth the natural size) which was found near the city of Perpignan in the Pyrenees Mountains. It is over four feet in length and about thirteen feet in circumference, and is the largest specimen in existence. It was found in a bed of clayey limestone belonging to the pliocene age; and, as the head and limbs had been withdrawn into the shell, after the usual

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