part broken up and offered in exchange for other materials of like nature. It will be known as the Allegan meteorite.

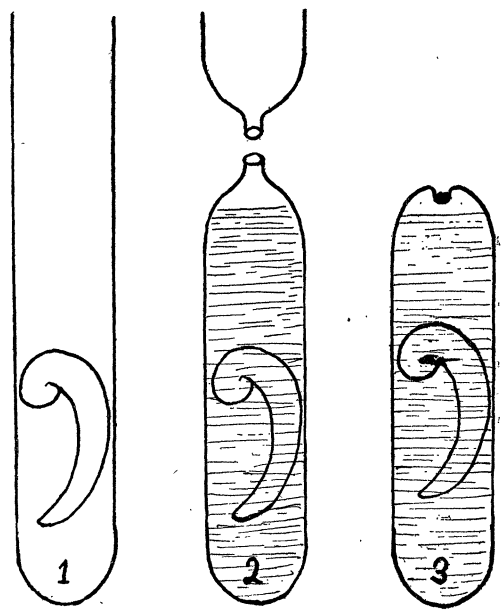
The second meteorite to which I have referred, is an iron, the main mass of which is now in the possession of Baylor University, Waco, Texas. It was found early in 1898, on Vaughn's farm, near Mart, in McLennan County. The iron weighed originally 19¾ pounds. The shape is an irregular oval, some 21.5 x 15 x 8.5 mm. in greatest dimensions, with two deep pits on one side. It was not seen to fall and is somewhat oxidized exteriorly. When cut and etched it shows well the Widmanstätten figures, and the presence of numerous spots of troilite scarcely a millimeter in diameter. This will be known as the Mart iron. Both the iron and the Allegan stone will be analyzed in the laboratories of the United States Geological Survey.

GEORGE P. MERRILL.

PERMANENT PREPARATIONS IN HERMETICALLY SEALED TUBES.

THE method of keeping various animals for demonstration and illustration in hermetically sealed tubes here to be noted has been in use in my laboratory for several years and proven itself so convenient and useful that I feel if it has ever been advocated before (of which I am not cognizant), it deserves revival, hence this note.

In brief the method is as follows: Glass tubing of a size just admitting the specimen is selected considerably longer than the final sealed tube is to be. One end is closed with or without a foot. The tube is then filled with 80% (or 70%) alcohol and the specimen is introduced, allowing it to drop down or carefully working it down the tube. Nearly all the alcohol is then poured off (Fig. 1). Specimens too delicate to admit of this must, of course, be kept covered with alcohol and the final tube be somewhat longer than necessary. The tube is now drawn to a point at some distance from the object and is broken off at the narrow neck (Fig. 2) so as to leave as small an opening as possible through which the tube can be filled up to or even above the shoulder of the drawn end. When the tube is filled the end is sealed in the Bunsen flame (Fig. 3). For filling the tube



finally one needs a 'tube-funnel' with a long small end that can be inserted into the neck of the tube.

Care must be taken to get the tube out of the flame before the expansion of the vapors becomes too great. When quickly done the sealed end will often be invaginated by the pressure from without, thus making an end not liable to have the button or bead broken off. In heating the tube after it has contained alcohol inflammable vapors will, of course, be formed. These are usually driven off with an explosion that one soon learns is not at all dangerous.

The secret of success lies in as small a neck as will admit filling and a strong heat applied quickly at the very end.

I have found Flemming's mixture of alcohol, glycerine and water usually better than pure alcohol. This mixture vaporizes less rapidly and as is well known keeps objects in excellent consistency.

For objects to be viewed only from one side or where two specimens, one for a dorsal view and one for a ventral view, can be used, the introduction of a strip of milky or black glass as wide as the diameter of the tube or a trifle less is an improvement for observation.

The method is of special value in the laboratory and lecture room. For toto specimens of animals (or organs admitting of this treatment) to be used by large classes it is excellent. The specimens can be examined closely and can be handled freely without danger of being ruined. In no other way known to me can medusæ, ctenophora and similar delicate animals be handled and studied so freely without injury to the specimen. Moreover, magnifying glasses can be used very easily and profitably.

Even many museum specimens can be thus preserved permanently and relieve the curator of the dread of a possible evaporation. Dr. MacDougal has found the method admirably adapted to many things in botany.

In the study of the embryology of many animals material thus preserved is of great value. The various stages thus preserved are marked in agreement with the series of sections of corresponding stages. In many cases the specimens can be stained and put up in balsam or damar or any other mounting medium for transparent objects. Such preparations in connection with serial sections are often invaluable and to the student are always a help well worth having on hand.

After I had used round tubing for some time it occurred to me oval tubing might be better because it would magnify and distort the objects less. The experiments made with large pig and chick embryos do not, however, favor the oval tubing, which, moreover, is more expensive than the circular tubing. Professor MacDougal, however, prefers it for some of his plant preparations.

Various details, such as mounting and labelling the tubes for the museum, suspending the specimen by means of a fine wire, etc., must be left to individual genius, likes and dislikes.

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SCIENTIFIC BOOKS.

Methods of Knowledge; an Essay in Epistemology. By Walter Smith, Ph.D., Professor of Philosophy in Lake Forest University. New York, The Macmillan Co. 1899. 12mo. Pp. xxii + 340.

Although Locke must be regarded as the founder of the philosophical discipline known variously as Epistemology, Noëtics, Theory of Knowledge, it remains true that thinkers who use English have lagged behind their German brethren in cultivating its special field. Thanks to Kant, to the renewed interest in his work after 1860, and to the direct influence of the particular sciences—which brought German thought back to Locke just at the moment when Britain and the United States were going to school with Hegel—Epistemology achieved an importance through writers like Schuppe, Cohen, Riehl, Avenarius, Busse, and to some extent, Lotze and Wundt, such as it has never enjoyed with us, and in all likelihood, will not soon gain. Professor Smith's work has, therefore, a place to fill; moreover, the author succeeds in presenting some fresh, if not striking, ideas.

Yet, no matter how favorably one may be inclined to view it, Epistemology suffers still from several capital defects. The delimitation of its precise sphere cannot be called complete by any means. Its relation to logic remains a moot point. Its commerce with psychology, and particularly its debt to psychological methods are undetermined or, at all events, subject to large variation of view. While, once more, even British experts, who have not found so much reason to trouble about its province as their German colleagues, have deemed it necessary to execute some excellent wrangling over its relation to metaphysics. Traces of this dispute remain in the work before us. The weaknesses of Dr. Smith's book appear to be direct products of the two last points. His epistemology, by accident or design I cannot profess to determine, overlaps the psychological sphere extensively. Possibly, one ought to forgive this tendency, because it imparts concreteness to abstract investigations of an exceedingly difficult kind. Again, his conception of the rela-