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-

tion of epistemology to metaphysics, in so far as it crops out, seems to me to be of a distinctively dogmatic character; dogmatic in the pre-Kantian sense. But this criticism, as Dr. Smith, and everybody else must be aware, depends greatly on point of view. And for myself, I am unable to see how epistemology and metaphysics can be disjoined as they appear disjoined here; especially, I must demur strongly to Dr. Smith's pronounced tendency to substitute epistemology for metaphysics in relation to some fundamental problems. I am aware that this is a popular direction at present; but this only emphasizes its temporary character.

The central portion of the work consists of a plain, straight-forward consideration of what might be called the law of homology, in some of its psychological aspects. 'Like is known by like,' and therefore, 'sympathetic imitation' must be regarded as the main and most adequate method of knowledge. Throughout this discussion the proper problem of epistemology, that of the relativity of human knowledge, is submerged, and a factor in experience, which no one would seek to deny, but which falls essentially within the purview of psychology, is put forward as if it furnished at once the ideal and the method. Knowledge is defined as "the presence in the mind immediately, or in copy of that which constitutes objects" (35), evidently on the tacit understanding that this position does not involve dualism, with its resultant scepticism. Just before enunciating this definition, Dr. Smith sums up the merits and defects of other theories of knowledge, without suspecting, however, that the emphasis on the one hand, between subject and object as different, and on the other, the stress on self-knowledge can be traced to an ultimate relativity, a *datum*, if you please so to call it, which is at once the justification of the existence of epistemology and the source of its problem. The dualistic implications of Dr. Smith's standpoint make themselves felt, and naturally, all through. Towards the close they at length become quite explicit. "It is the function of knowledge to equate itself with its object" (266); and on the next page, Dr. Smith quotes, with apparent approval, Mr. Spencer's declaration, "the perception of relations is not the perception of the things themselves." Provided 'perception' be taken in the same sense in both clauses, can such a form of words be said to express anything thinkable by man? Just because epistemology *is* a science with a problem and a solution for it, things cannot be set over against relations and apart from them in this airy fashion.

Although the book is not an epistemology and even illustrates a kind of philosophical backsliding, sporadic now, it presents its good points. The chapter on 'Sympathetic Imitation in Art' contains some admirable reflections; the fatality of hurried systematization is pressed home well, and the entire argument is marked by the presence of an all-round culture very refreshing in these days of one-eyed specializing. As has been indicated, Dr. Smith has not embraced the inviting opportunity to contribute an authoritative work in English to epistemology. He has done appreciable service, nevertheless, by entering a series of *caveats* which some eager spirits would do well to bear in vivid remembrance.

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Die Kontinuität der Atomverkettung ein Strukturprinzip der lebendigen Substanz. By DR. GEORG HÖRMANN. Jena, Gustav Fischer. 1899. 3 M.

That such structures as nerves, or even an entire animal, might be regarded as single, huge, chemical molecules was an hypothesis advanced by E. Pflüger a quarter of a century ago. Observation and speculation since have almost unanimously tended toward the prevalent morphological conception of living matter as an aggregate of separate units, while Pflüger's idea has lacked support. In the present essay we find an interesting attempt to extend and to develop Pflüger's hypothesis by logical reasoning illustrated by diagrams.

The author would have protoplasm a net work composed of living matter, with its meshes filled by the various liquids, etc., that go to make up the complex whole.

This network is molecular, invisible, purely hypothetical. The living part of organisms is,