marked discrepancies of result and inference on the Thebesian question as it concerns the possible compensatory function of these vessels in chronic coronary occlusion, and commendably emphasizes the urgent importance of having the problem settled with finality. In the future development of the subject Swedenborg's proposition may well find a place, historically, as embodying in principle one widely entertained hypothesis relative to the cardiac sinusoids. Even more, his almost modern structural conception of the intramural vascular relations, based on the injections of Lancisi and other eminent early anatomists, should have similar recognition.

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SUGGESTIONS IN STRATIGRAPHIC NOMENCLATURE

PERHAPS others as well as the writer have often been at a loss for a concise, logical and self-explanatory term for indicating all that portion of the geologic sequence (or geologic time) below or antedating the Cambrian system (or time). Strangely enough, the embarrassment becomes more acute if one searches for a term to include the Paleozoic, Mesozoic and Cenozoic. To the lower or earlier subdivision such terms as Azoic, Eozoic, Agnotozoic, Proterozoic, pre-Cambrian and pre-Paleozoic have been applied by various authors in different ways.[1] Chamberlin and Salisbury make a dual subdivision of this expanse of time into an Extrusive and a Gradational Eon, but in the latter they include the Proterozoic, as understood by them, and the basis is not "zoic," a feature so well fixed in geologic nomenclature since the days of John Phillips. Haug's treatise devoting one chapter to pre-Cambrian, the next to Cambrian, the next to Silurian, etc., does not clearly bring out the dual classification here under consideration. Ambiguities and needless circumlocutions are to be found in our most recent and authoritative writers on geologic topics owing to a lack of precise terminology.

Note the following:

> . . . the high degree of evolution and specialization seen in the invertebrate fossils at the very base of the Paleozoic was in itself a proof that pre-Paleozoic evolution occupied a period as long as or even longer than the post-Paleozoic.[2]

The meaning here is in doubt, but the chances are ten to one the author means post-Proterozoic, instead of "post-Paleozoic," else the whole Paleozoic is eliminated in his second time division. Again, p. 29, *op. cit.*

> The larger estimate of 80 million years on the theory that pre-Cambrian sediments took as much time as those from the base of the Cambrian upwards.

Bearing in mind the unique and overwhelming importance of life in the development of this planet and the still unexplained but universally recognized earlier moiety of geologic time, characterized by obscure traces of life, and a later moiety with life so abundantly preserved, one may perhaps denominate the earlier as the *Cryptozoic* and the latter as the *Phenozoic* Eon, unless more descriptive terms have already been suggested. Hence the above quotations would read:

> . . . the high degree of evolution and specialization seen in the invertebrate fossils at the very base of the Paleozoic was in itself a proof that Cryptozoic evolution occupied a period as long as or even longer than the Phenozoic.''

> ''The larger estimate of 80 million years on the theory that Cryptozoic sediments took as much time as Phenozoic.''

Ambiguity, hyphenated hybrids and needless circumlocutions seem accordingly to be avoided.

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RUPTURED YOLK IN HENS AND PULLETS

SEVERE losses occur among chickens from a disease which sometimes results in the rupture of egg yolks in the abdominal cavity. Once established in a flock, the disease usually persists over a long period. In some flocks the death losses have amounted to more than 50 per cent. within a month.

In studies made on 87 flocks, *Pasteurella avicida* was recovered from 48 per cent. *Salmonella pullorum* and *Salmonella gallinarum* were found in a few cases.

Detailed studies were made on the pathogenicity of *Past. avicida* found in cultures and in tissues from field cases in eight flocks. Intramuscular and intraperitoneal injections of cultures and of yolk material from diseased birds caused death in from 18 hours to five days or longer. Infection sometimes occurred, following intranasal inoculation and when cultures were placed in drinking water. The introduction of cultures directly into the crop failed to produce infection. Lesions typical for the disease were produced in experimental birds and cultures of *Past. avicida* were recovered from most of the birds injected.

Post-mortem examinations of field cases and of experimental birds revealed the lesions usually described for fowl cholera. In addition to these lesions,

[1] See Gregory and Barrett, *Jour. Geol.*, 35: pp. 747–742.

[2] ''Origin and Evolution of Life,'' 1930, p. 28.

definite changes usually occurred in the ovaries, and in many instances, ova ruptured and yolk material escaped into the abdominal cavity. The ovarian lesions were not found in those cases which developed septicemia and died very suddenly.

Ten healthy pullets were injected intraperitoneally with the entire yolk content of eggs laid by healthy hens. This was done in an effort to determine whether or not the possible rupture of a normal ovum would cause disease. The ten pullets failed to develop symptoms and autopsies on four revealed the fact that the injected yolk material was quickly absorbed.

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THE RÔLE OF BACTERIA AS FOOD FOR BOTTOM ANIMALS

IT has long been my opinion that we have not given bacteria sufficient credit for the part they play in the food supply of mud-flat and ocean-bottom animals.

Two Gephyrean worms of the species *Urechis caupo* Fisher and MacGinitie[1] were placed in rotted sea water and fed a culture of the bacterium *Pseudomonas* sp. for a period of 68 days. During this time these worms showed a growth which was greater than that usually occurring in nature. Two controls wasted away and died after 61 and 63 days, respectively.

Urechis caupo was used for this experiment, because it lives in mud-flat regions rich in bacteria and because it feeds by spinning a slime net, which intercepts all particles within the range of microscopic vision.

From the results of the above experiment it may be concluded that if a bottom animal can use a cultured bacterium as food and show normal or increased rate of growth, it seems safe to assume that when bacteria occur in the food of such animals in nature they are utilized in the proportion in which they occur.

The use of bacteria as a food supply offers possibilities for their use in rearing larvae for developmental studies and experimental embryology.

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SCIENTIFIC BOOKS

Wild Beasts To-day. By HAROLD J. SHEPSTONE.

I WAS constrained, not long since, to buy a book called, "Wild Beasts To-day" by Harold J. Shepstone, largely because it was an English book and because it had been well reviewed. English writers on natural history have, in the past, set for themselves a splendid standard, and I for one have for years been buying books on wild life by British writers with a sure confidence that an evening's reading would be a real pleasure. The tendency, so obvious on the part of some American writers, to capitalize at a high advertising value facts which are unknown to the average reader, though well known to scientific persons familiar with the literature of their profession—this tendency has been conspicuously absent in the case of English writers, and this has been no small factor in explaining the considerable sale in America of English books on popular natural history.

With this preamble I will now add a few observations on Shepstone's book.

It is thoroughly well made, light, type well chosen and with many excellent illustrations. Some chapters are well written, as that dealing with the London Zoo and Whipsnade, but the book at large so abounds in inaccuracies as to cause one to be bewildered that so great ignorance can exist in one who makes bold to write a book. We read (p. 69) the old, silly story that a twelve-foot alligator is from seventy-five to one hundred and fifty years old—it is more likely twenty. The author speaks of his friend Campbell controlling his unruly alligators "by means of a hypnotizing effect" (p. 78). We read of snapping turtle farms in Japan (p. 93), but the snapping turtle, by universal usage, is the American Chelydra. These Japanese turtles can also bite through a stout cane or bite off the blade of an oar (p. 85), which, of course, is pure nonsense. The fact that the blow of a green turtle's fin will break a man's leg (p. 87) will be a surprise to those who have handled green turtles. The famous snake farm at Butantan in Brazil is a serotherapeutic, not serotherapic, institute, as Mr. Shepstone repeatedly calls it (p. 91). On p. 95 we read that snake venom has a high curative value in medicine, and it is declared to be a cure for epileptic fits as well as beneficial for rheumatism and certain cases of insanity. This will cause surprise and rejoicing in medical circles. There is a South African snake called a ringhals, but no ringhal (p. 96). So also there is a town in Arizona called Tucson (pronounced "Tooson"), but no town called Tuscan, nor do I know

[1] For a complete description of the feeding habits and natural history of this worm, see *Ann. and Mag. Nat. Hist.*, Ser. 10, Vol. 5, p. 204, July, 1930.