Lecture V., Temperature Radiation, gives a very brief résumé (with a new notation) of the laws of temperature radiation. In the generality of the statements, however, accuracy is ofttimes overlooked. It is not true that (p. 74) "Practically all bodies give the same temperature radiation, *i. e.*, follow the temperature law (1)" (which states that the total emissivity is proportional to the *fourth* power of the absolute temperature). For most substances investigated the exponent should be greater than "4," in some cases (see recent investigation by Coblentz, Bureau of Standards Bulletin, Vol. 5, p. 339) as large as 6 or even 7. Little attention is given to the effect of selectivity (though slight mention is made of it) in determining the high efficiencies of some sources, such, for example, as the osmium lamp. It is at least questionable whether (p. 80) the melting point of osmium is higher than that of tantalum merely because it can be operated at a higher efficiency. Osmium undoubtedly is distinctly selective.

On the whole, although the book is extremely interesting to the technical reader and is quite suggestive, there would appear to be a lack of care in gathering together the facts, and a somewhat too dogmatic style in presenting those topics which are still more or less in the domain of speculation. The color pyrometer described on pp. 89–90 is apparently a real instrument, but any attempt to reproduce it would soon convince one that no mixture of spectrum yellow and spectrum blue would give a green that could be matched in hue with spectrum green. Numerous small errors, both typographical and factual, could be cited, but would scarcely strengthen the conclusion that an early revision of the book would be most welcome.

The reviewer desires, however, to express his appreciation of the service which this book has rendered in coordinating the closely related phenomena of physics and physiology in their relation to illumination, and in calling attention to many vital questions of illumination which are frequently given too little attention in practise (such as those of directed and diffused illumination, shadows, the effects of sources of high intrinsic brightness in the field of view, etc.).

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Die Säugetierontogenese in ihrer Bedeutung für die Phylogenie der Wirbeltiere. Von A. A. W. Hubrecht. Jena, Gustav Fischer. 1909. Pp. 247, 186 text figures.

Most zoologists know that Professor Hubrecht has been an assiduous student of mammalian embryology for many years. The reviewer well remembers the beautiful preparations—probably of *Tupaja*—exhibited by the author at the Oxford meeting of the British Association in 1895.

The appearance of a volume on the subject from such experienced hands may be supposed to be an occurrence of no little interest to students and teachers in this province of biology. Whether the volume that actually comes to us fulfills expectations depends largely on what the particular user may feel in need of, and what his standpoint may be with reference to the more general problems involved.

If one be chiefly desirous of a manual that should set forth the main facts of mammalian development positively ascertained up to the present moment, along with such generalizations as a conservative zoologist might recognize as truly illuminating and not objectionably forced, the book can not be very satisfactory, so it would seem.

If, on the other hand, one would wish to see how strong a case a competent specialist can make of a fundamental theory of his own, then the work may be adjudged satisfactory. What we have essentially is a case of special pleading, as indeed the title permits if it does not intend us to infer. Not mammalian ontogeny, but such ontogeny in its significance for vertebrate phylogeny, is the aim.

This statement is not intended to give the impression that the reader longing for facts primarily will find nothing to his purpose. Not only the text but the many figures present very many facts. Such a summary, for ex-

ample, as is given on page 3, of the chief works on the cleavage of mammalian eggs, should be highly appreciated by the general student.

There are in all six chapters, as follows: I., The First Cell Layers—(A) Of the Monodelphic and Didelphic Mammals; (B) Of the Ornithodelphic Mammals and Sauropsida, and (C) Of the Ichthyopsida. II., Farther Development of the two Germ-layers of the Vertebrata up to the Origin of the Somites. The Mammalia, the Amphibia, the Sauropsida and Ornithodelphia and the Fishes are treated. III., Diplotrophoblast-Serosa (Subzonal) Membrane, Chorion, Allantois and "Nabelblase" in Onto- and Phylogenesis. IV., The part taken by the Trophoblast in the Nutrition and the Attachment of the Embryo. V., Various Points (Verschiedenes) on Placentation. VI., Considerations Touching the Phylogeny and the Systematic Divisions of the Vertebrata.

These contents of the chapters will suffice to show that as regards embryology proper only the very early stages are dealt with. Organogenesis does not fall within the scope of the work. The undertaking is such, too, that vertebrates other than mammals receive large attention. Of the 186 figures nearly one fourth are not mammalian, the larger number of these outsiders being of fishes, amphibians and reptiles.

As to exactly how much weight should be attached to Hubrecht's theory in its various ramifications (his trophoblast theory) only a student of the vertebrata can tell who is more experienced than he, and is far less of a special pleader. But any zoologist who is moderately well informed first hand in general vertebrate morphology and embryology, and who has likewise occupied himself in a serious way with problems of phylogeny, can readily see that the best that can be said for the most far-reaching contentions is that they may *possibly* be true. While it may be legitimate for a zoologist to find a measure of satisfaction in recognizing the various possibilities as to what the course, or rather courses, of vertebrate evolution may have been, it is well never to lose sight of the fact that what is only possibly true is probably not true.

Hubrecht has pointed out facts enough to make it *possible* that his "vermactinial stage in vertebrate phylogenesis," figured on page 22 and again on page 228, was a reality in some remotely past time. But dozens of other facts which he has not alluded to make it *probable,* to the reviewer's mind at least, that no such ancestral stage ever did exist.

Such a hypothetical creature would be harmless, indeed might have a certain usefulness, could it be presented merely as one among numerous possibilities, for if so presented it would not be chargeable, as it is almost sure to be when claiming exclusive rights, with distorting the facts upon which its existence depends; and it, along with its alternatives, might then help the mind to grasp the general truth that the actual animals dealt with have arisen by a natural, that is, an evolutionary process.

LA JOLLA, CAL. WM. E. RITTER

THE SILKEN-HAIRED ONES

WHAT "Black Beauty" did for horses President Jordan's "Story of Matka"[1] ought to do for the unfriended fur-seals of the Bering Sea. The ruthless slaughter of these seals which will end, if not soon interrupted, in their certain extinction, is a hideous present-day world crime of which three great powers are openly guilty. In 1880 two and a half million fur-seals lived in Bering Sea. In this year 1910 of enlightened civilization, scientific knowledge and Christian sweetness and light there are still by good fortune alive 150,000 of these beautiful, silken-haired, soft-eyed creatures of nature's choicest making. The others have been slaughtered as mothers or starved as children by the refined methods of diplomacy cultivated by Great Britain, Japan and the United States.

Dr. Jordan wrote the "Story of Matka" on the very rocks where Matka lived, with Matka the mother seal and Kotik, the baby seal and Atagh, the grandfather and Eichkao, the blue

[1] "The Story of Matka," by David Starr Jordan. San Francisco, Whitaker-ay-Wiggin Co., 1910.