

7. Clearly stating, and securing general recognition of the difference between the origin of a character and its selection.

8. Formulation of the working hypothesis of pangenesis. *This was the parent-idea of the entire mutation-theory.*

9. Elaboration of the mutation-theory.

10. The unfolding of new problems and of entire new fields of research. The influence of the mutation-theory (like Darwin's "Origin") amounts to little less than a rejuvenescence of all biological science.

The English translation has had the advantage of the author's careful revision and correction, and embodies certain changes made necessary by Nilsson's work on the selection of cereals.

The second volume of the German original is in process of translation and will be eagerly awaited. Some of the more technical chapters of this volume, relating to hybridization, will be omitted and their translation published separately.

English-speaking botanists and zoologists owe a debt of sincere gratitude to Professor Farmer and Mr. Darbishire for rendering so invaluable a book into their native language. The press work is also commendable, and we should appreciate the willingness of the publishers to undertake the publication of so extensive a work of this character. It is easier to get this done in almost any other country than in the United States.

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The Story of the Submarine. By Colonel CYRIL FIELD, R.M.N.I.

This is a popular review of the history and traditions of submarine warfare and navigation from the earliest ages to the present day. The manner of presentation is well conceived and the illustrations are sufficient, without going too far into detail. The traditional part appears to be drawn from medieval marvel mongers who never missed a good story nor spoiled it by leaving out picturesque details. But by the second chapter the author takes up his history in which he is precise

and conscientious. In the middle of the seventeenth century real submarines were built and navigated, but the progress was slow and intermittent, since they were almost all made of wood and propelled by hand, even so late as the middle of the nineteenth century. The form of the submarine and the difficulties of submarine navigation were by that time fairly well understood, but the lack of mechanical propulsion made the increase of size of little avail.

The author's strict adherence to chronological order fails to throw into relief the really essential features of the development of submarines, such as the chemical generation of oxygen by Payerne, the application of steam power by Garrett and the introduction of the storage battery by Goubet. In the same way the development of the submarine in France and in America loses connection from the fact that first one and then the other comes up for discussion.

The modern submarines appear to be possible on account of the combination of the internal combustion engine (used by Holland), the storage battery, together with devices for controlling direction and submersion. Each of them is described in its proper place, but the reader is left to recognize the combination. In like manner the submarine torpedo is described as the proper weapon of the submarine, but its direct influence on the development of the submarine, due to the perfection of control of the torpedo, is not mentioned.

The author's description of the submarine of to-day is sufficient for his "man in the street," and one may charge to official secrecy and rapidity of development his failure to distinguish clearly between submarines and submersibles and why the latter have been developed to such a displacement of 1,000 tons with a speed of sixteen knots at the surface. His conservative estimate of the importance of the submarine and of its use for other than warlike purposes must be respected.

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