ened, they should be set on end on a cool moist surface and enough melted paraffin poured in to form a bottom four or five millimeters in thickness in each of the bottles. After cooling, each bottle should be filled with melted paraffin and emptied, a process that should be repeated every few minutes until a rather thick coating has formed on the inside. The exterior should be treated in a similar way by dipping the bottles into melted paraffin.

Rubber stoppers can be fitted to these bottles by warming the neck of each and by pressing a stopper, of the proper size, into the opening before the paraffin cools. If rubber stoppers are not available, ordinary bottle-corks, which have been coated with paraffin, can be used with quite as good results.

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NOTES ON CUBAN FRESH-WATER FISHES

WHILE collecting fossils in the province of Santa Clara, Cuba, in 1911, my work took me to Baños de Ciego, Montero, 30 miles north of Cienfuegos. Here occur three hot springs having a temperature, respectively, of 93, 96 and 99 degrees Fahrenheit. These springs are grouped close together, not more than 20 yards apart and about 200 yards from the Analla River into which they drain. The springs of 93 and 96 degrees temperature are walled in and the latter is surrounded by a hotel. The one of 99 degrees temperature is of largest volume and has direct communication with the river. In this spring as well as in the drainage water of the other springs and the cold water of the river, I found a great many fishes, mostly viviparous.

The following species have been identified from the spring:

Symbranchus marmoratus Bloch.
Gambusia puncticulata Poey.
Glaridichthys falcatus Eigenmann.
Girardinus matallicus Poey.
Pœcilia vittata Guichenot.
Heros tetracanthus (Cuv. & Val.).

Of these the eel-like *Symbranchus marmoratus* was found only in the hot spring. The other species, so far as I was able to observe, were common to both the cold water of the river and that of the hot springs, becoming acclimated by degrees, until they were finally able to live in the hottest water, 37° Centigrade, approximately that of blood temperature.

I was curious to know if it were possible for these fishes to live equally well in the hot spring water of 99 degrees temperature and the river water of 60 degrees temperature without first going through a process of acclimization, so conducted a number of experiments. It was quite evident that fishes could gradually come from the cold water into that of the hottest temperature, so I took a number from the hot spring, carefully catching them in a net so as to avoid injury and placed some in river water and others in water from the other springs. Those placed in water of 93 degrees temperature seemed to live in it as well as in that of 99 degrees, but those placed in river water, out of eleven fishes, nine died within ten minutes. The other two lived.

This experiment was repeated several times with similar results; more than two thirds failing to resist the sudden change of temperature.

I am unable to tell whether those used in the experiments were *Gambusia puncticulata, Glaridichthys falcatus, Girardinus metallicus* or *Pœcilia vittata,* but probably they were mostly the latter genus and species, as this form was most abundant in the Chapapote spring.

While living in the hotel during a heavy storm the Analla River overflowed, sending a branch across this Chapapote spring. The following day we pumped out the water, finding a great many viviparous fishes, probably all of the four determined small species and a number of viajecos, *Heros tetracanthus.* Evidently they had all become acclimated to the hot water during the time of this overflow.

Besides the species mentioned, the collection contains two species which were not found in the warm spring, *Gambusia punctata* Poey, of which two were obtained from the Rio Analla and several from a tributary of the Zaza, and

Glaridichthys torralbasi Eigenmann, represented by one specimen from the latter locality.

Barnum Brown

SCIENTIFIC BOOKS

A History of Geographical Discovery in the Seventeenth and Eighteenth Centuries. By Edward Heawood, M.A. Small 8vo. 475 pages. Cambridge University Press.

This work is one of the Cambridge Geographical series, its author being librarian to the Royal Geographical Society. Its aim is to deal with the less known period which followed the great discoveries of the fifteenth and sixteenth centuries. The author defines his period as "that in which, after the decline of Spain and Portugal, the main outlines of the world-map were completed by their successors among the nations of Europe." The book is therefore a narrative mainly of the explorations of Great Britain, Netherlands, France and Russia. The sphere of the French was largely in North America, and Russian endeavor was devoted to northern Asia and its adjoining seas, while it was left to the English and Dutch navigators to fill in the map of the remote seas and distant lands of the globe.

At the close of the period the map of the world was distinctly modern, though it remained for the explorers of the nineteenth and twentieth centuries to fill in most of the map of Africa and of the polar regions, and to make more advanced surveys and detailed study of all lands and seas.

The author is hampered by the necessity of crowding a vast amount of material into a small volume, which is an encyclopedia in outline, and hence lacks continuity, and interest for the general reader. Hundreds of localities and explorers are noticed, each in a sentence or two, with the barest statement of what the explorer did, or tried to do. But this is probably the fault of the series as planned, and not of the author. In a few instances he has given a relatively full and keenly interesting narrative, as, for example, of Tasman, Anson, Hudson, Cook and Vancouver.

About sixty illustrations contribute substantially to the value and interest of the volume. These include many maps belonging to the period, and several portraits of the more eminent navigators. Considering its small size, about four hundred pages of text, the work is well suited for reference, particularly by reason of the thoroughness with which the index has been prepared. This occupies about fifty double-column pages and contains several thousand entries.

Albert Perry Brigham

Terminologie der Entwicklungsmechanik der Tiere und Pflanzen. In Verbindung mit Professor C. Correns, Professor Alfred Fischel, Professor E. Kuster von Professor Wilhelm Roux. Leipzig. 1912. Pp. xii + 465.

This book represents a type of purely scientific publication which has been scarcely attempted as yet in this country for any field of the biological sciences. As Professor Roux points out in the preface of the book, the development within recent years of analytic investigation in biology has brought about the development of a new terminology, especially in connection with embryology and inheritance. The purpose of this book is to make it possible to determine readily the meanings given to new terms by their authors, as well as the special meanings which many terms have acquired in connection with experimental and analytic investigation. That a real need for a book of this sort exists Professor Roux regards as evident because, as he says, the previously published terminologies of zoology, biology, medicine, etc., have for the most part omitted the special terminology of developmental mechanics.

The book defines some eleven hundred terms, purely philosophical terms being excluded and botanical and zoological terms being combined as far as seemed advisable. But that the book is far more than a simple dictionary will be evident from the fact that the eleven hundred terms occupy nearly five hundred pages. In many cases reference is made not