

EXPLANATION OF FIGURES

Permanent stained stages of spermateliosis in *Cryptobranchus* (1-9) and *Necturus* (10-19). Abbreviations: acb, acroblast; acr, acrosome; af, axial filament; ep, end piece; f, flagellum; m, mitochondria; n, nucleus; np, neck piece; pb, protoplasmic bead; um, undulating membrane or sheath.

1. Spermatid with numerous mitochondria and acroblast.
2. Later spermatid with ring and granule, mitochondria and acroblast.
3. Elongation of the spermatid; acroblast and ring-granule oriented at poles of nucleus; filament that is combination of axial filament and flagellum emerges from granule and passes through the ring. This filament has motility.
4. Later stage. Posterior nuclear material condensing; small acrosome in acroblast; filament is 370 micra long.
5. Axial filament and flagellum are separated with axial filament increasing in size.
6. Elongated acrosome in acroblast outside the nuclear membrane.
7. Perforatorium at anterior end of nucleus; axial filament now of maximum thickness.
8. Mature sperm of *Cryptobranchus*; protoplasmic bead with mitochondria; flagellum is drawn into waves alongside the axial filament.
9. The end piece and portion of the flagellum and sheath have separated from the axial filament.
10. Spermatid with spherical mitochondria, acroblast, granule and double ring.
11. Elongation of the spermatid nucleus and origin of neck piece inside the nuclear membrane; filament emerges from granule and passes through the ring.
- 12-14. Further elongation of the spermatid; neck piece is elongating and chromatin is condensing.
15. Maximum elongation; axial filament and flagellum are now separated; cell membrane is elongating down the axial filament.
16. Enlarged portion of the axial filament and flagellum with mitochondria after treatment with tetrazolium chloride; made in October.
17. The same; made in December. The mitochondria are reduced in number.
18. The same; made in February.
19. Mature sperm of *Necturus*; total length 900 micra. (Note that sketch is one-half size of developmental stages.

BOOK REVIEW

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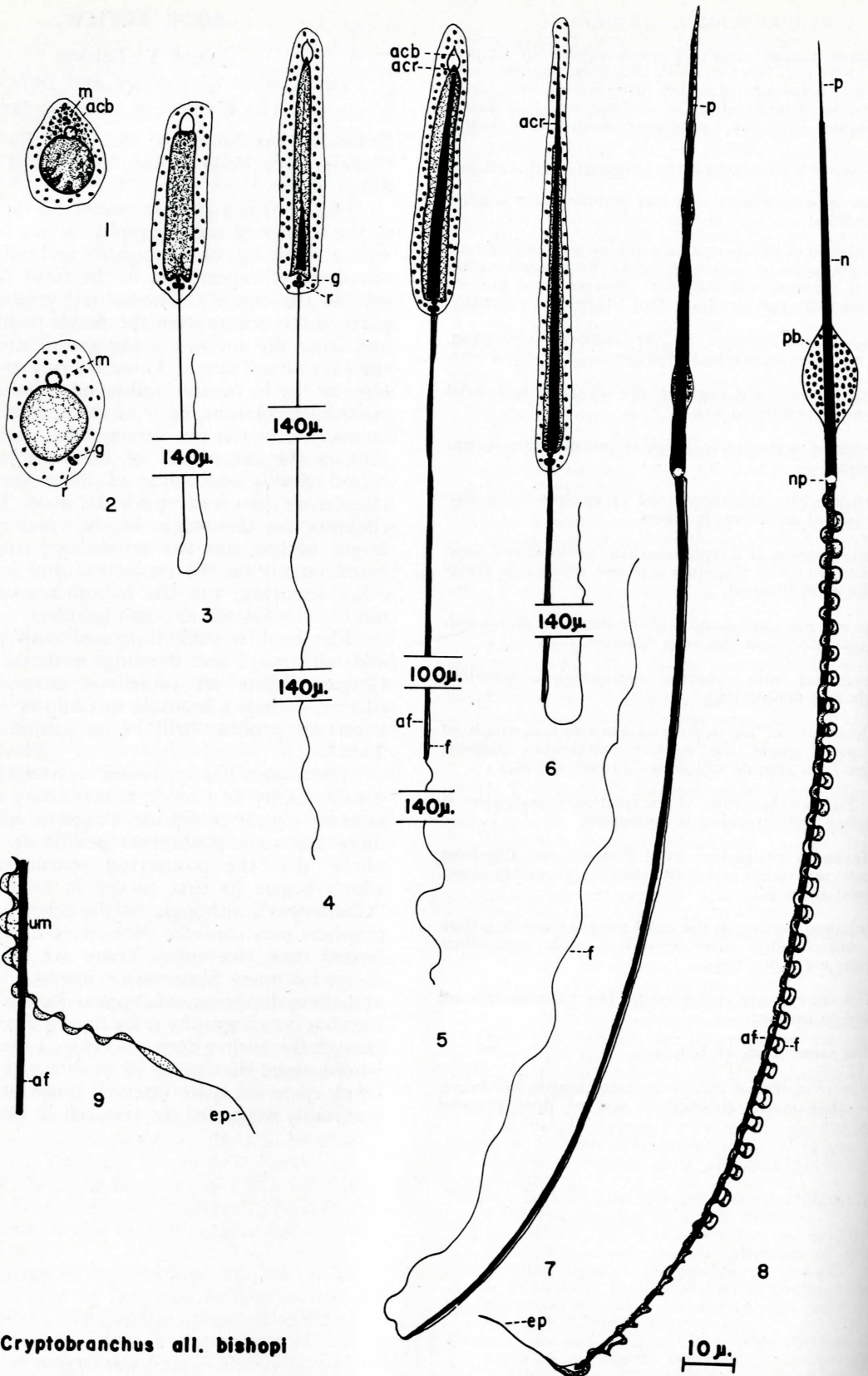
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Exploring the Secrets of the Sea. By William J. Cromie. Prentice-Hall, Inc. Englewood Cliffs, N.J. 315 p. \$5.95.

This book is a good introduction for the layman to the science of oceanography. It has been written with a minimum of technicality and enlivened with anecdotes of experiences in the field (or should I say "in the ocean"). The subject matter covers all parts of the oceans from the Arctic to the Antarctic and from the surface of the sea to the bottom of the Marianas Trench. There are one or more chapters on each of the following: the oceans and oceanic circulation, floor of the ocean and its sediments, life in the sea, waves, tides, methods of exploring the ocean. All of these subjects are discussed clearly and some of them very well; the chapter on tides is exceptionally good. The first two chapters, on the origin of the earth and on the origin of life, are less satisfactory since they are based largely on the conjecture and hypotheses of other scientists, and the hypotheses suggested are not directly related to oceanography.

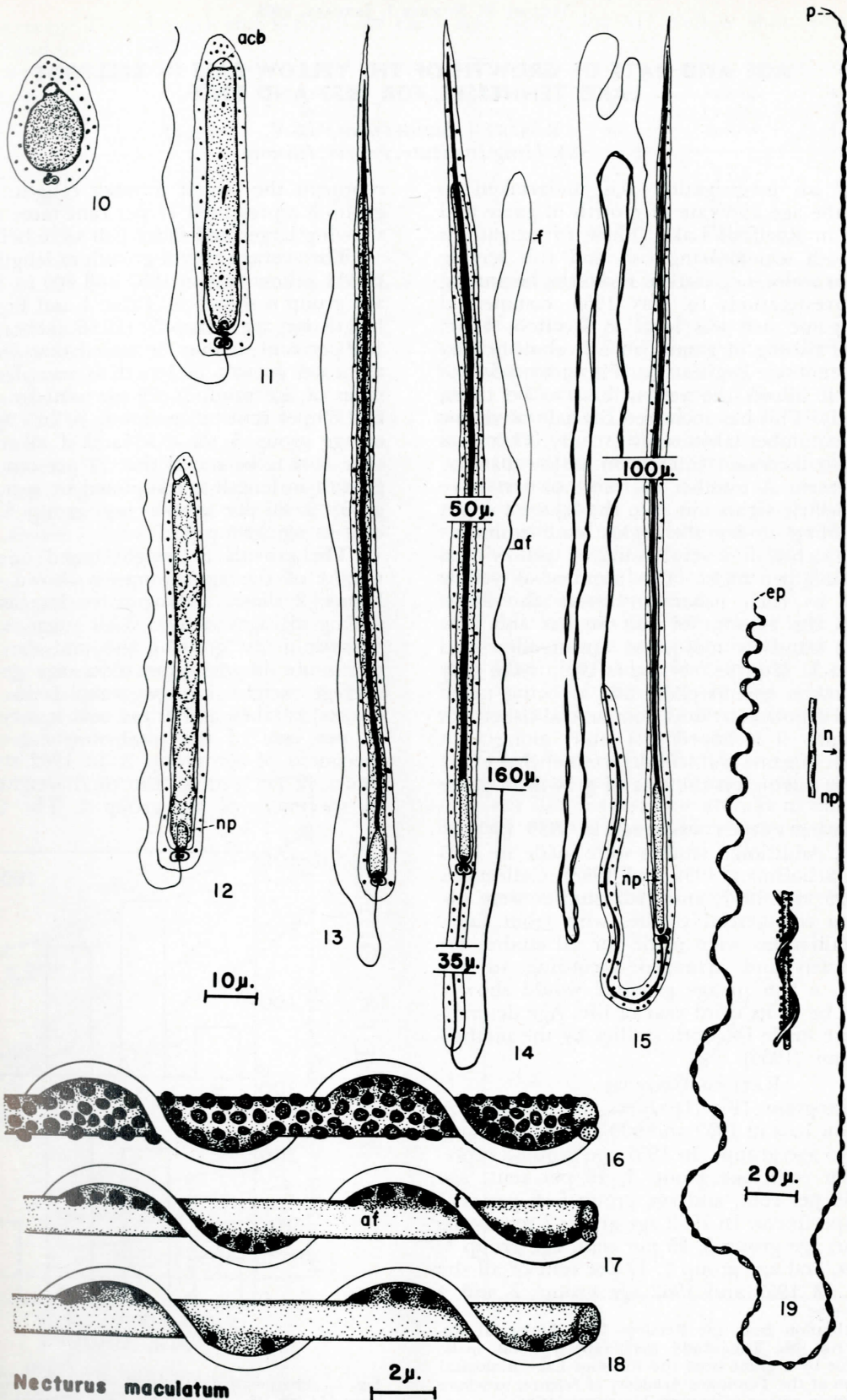
The book is well illustrated with photographs and with maps and drawings executed by George Geygan. There are occasional examples of poor editing, such as a footnote in Chapter 8 saying that a certain process "will be explained in Chapter Two."

The author has succeeded very well in picturing oceanography as a modern and active science with as many clearly recognized problems ahead of it as there are accomplishments behind it. It was prophetic that the pioneering oceanographic vessel which began its first survey in 1872 was named "Challenger", although, on the other hand, oceanographers may consider themselves to be more challenged than vice versa. There are opposing hypotheses for many phenomena observed in the ocean, and these disagreements appear in this book, showing that oceanography is far from a dead science. Although the author does not say so, I am sure that he would agree that many of millions of dollars now being spent on space research could be much more profitably expended for research in the oceans.



Cryptobranchus all. bishopi

See Page 9 for Explanation



Necturus maculatum

See Page 9 for Explanation