This observation is at once applicable to the steam in radiator pipes. Most text-books in physics give the following explanation: "The sharp rattling noise in steam pipes is due to the water hammer. A column of condensed water is driven along the pipe by the steam, the cooler steam ahead of the column condenses, and the column of water hammers against the end of the pipe or against a stationary body of water in the pipe." This description of the phenomenon is correct as far as it goes, but it fails to emphasize the fact that for the sharp clicks the whole mass of water vapor between the two surfaces of water (that is, the bubble) *condenses into water instantaneously.*

The observations upon the bubbles in the cryophorus were made by my assistant, Mr. Lee Fullmer, who also differentiated the sharp clicks in the steam-pipes from the duller thud of the water hammer.

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SCIENTIFIC OBSCURITY

SINCE it has been my lot for many years to earn my living by translating scientific literature into the vulgar tongue, I have often wondered why the writers made it such hard work to read the original language.

If the difficulty were due to the profundity of the thought or complexity of the reasoning, then it could not be avoided. But I have found that important papers by the deepest thinkers were apt to be easier to follow than those by minor men dealing with comparatively trivial topics.

Nor does the cause of the obscurity lie, as is commonly said, in the use of technical terms. The sports section or fashion page of a newspaper has as specialized a vocabulary as a scientific paper. Many scientists do indeed employ technical language unnecessarily in writing for the outside public, but even where the words are all familiar the meaning may still be obscure.

I have come to the conclusion that the chief reason why scientific literature offers such high resistance to reading is the use of the alternating current instead of the direct in conveying the thought. The writer interposes a negative every few words that reverses the meaning of the sentence. This keeps the reader on the jump.

The asymptotic ideal toward which scientific writing tends is a sentence structure something like this:

> The present writer is indisposed to deny that he is unconvinced of the necessity of refusing to accept the infrequency of negative reactions as a not insuperable argument in disproof of the theory.

Such sentences may be quite logical and free from technical terms. They can be disentangled in time and when straightened out the meaning may turn out to be something simpler than it sounds. But they are constructed like the Chinese boxes, when you get one opened you come on to another. The process of extracting the meaning is like the simplification of a complicated algebraic equation, and in extricating the internested parentheses you are likely to come out with the plus and minus signs mixed.

In conclusion, the present writer is indisposed to deny that he put the wrong title at the top of the letter. It should be, not "Scientific Obscurity" but "Unscientific Obscurity in Writing on Scientific Subjects."

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SCIENCE SERVICE,
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SCIENTIFIC BOOKS

Birds of the Pacific States. By RALPH HOFFMANN. Boston, Houghton Mifflin Co., xix + 1–353 pp., with 10 color plates, and over 200 black and white illustrations, by Major Allan Brooks. 1927.

THE diversity of native animal and plant life in the Pacific states has long been a source of attraction for students of biology, but beginning acquaintance with the fauna and flora has heretofore been hampered by the lack of suitable manuals. This need is now in process of being satisfied, as during the past three years there have appeared four important keys which will help to unlock the doors leading to accurate knowledge of the western biota. Jepson's "Manual of the Flowering Plants of California" is the first statewide botanical key for California; Essig's "Insects of western North America" is the very first comprehensive western volume in entomology; Johnson and Snook's "Seashore Animals of the Pacific Coast" is the pioneer volume in the popularizing of western marine biology; and Hoffmann's "Birds of the Pacific States," while preceded by other volumes dealing with birds, easily stands premier as a manual for field ornithology in the west.

Most bird students are interested in the living bird, and in the early stages of their interest they are concerned chiefly with the problem of identification in the field. Despite this obvious fact, a majority of the bird books heretofore issued have ignored or given but minor attention to this phase of the subject. Mr. Hoffmann was, and still is, a pioneer in the production of workable field manuals. In 1904 there appeared his "Guide to the Birds of New England and eastern New York" which dealt with "over two hundred and fifty species with particular reference to their appearance in the field." For the novice this volume is still the best field book of birds for the area