transformation of plant life entering the environment of caves are humidity and reduction or total elimination of light. He further emphasizes the fact that of the American caves he has visited, he did not find the flora as rich as that of Europe and the neighboring species, but more transformed.

One wonders whether the flora in large caverns in the desert area of southwestern United States has not been more transformed where the humidity of the upper part of the cavern is affected by the regional environment.

WALTER B. LANG

U. S. GEOLOGICAL SURVEY

THE HEATH HEN

THIS is rather a belated attempt to draw attention to one of the statements made by Dr. W. C. Allee in his article published in SCIENCE for June 11 in which he cites safety in numbers as one of the evidences of natural cooperation. This is one of the most important principles of conservation and one which should be driven home to all Americans. I do not think there would be a better way to explode the idea that a single pair of animals can regenerate a host of the species than to quote from another publication of Dr. Allee's, "The Social Life of Animals," discussing the fate of the heath hen.

> The heath hen was most abundant in Massachusetts, but by 1850 it had been killed off until it was to be found only on Martha's Vineyard and nearby islands and among the pine barrens of New Jersey. By 1890 to 1892 the birds had diminished to a scant two hundred at most, restricted to Martha's Vineyard. As soon as the "bird stuffers" heard how rare they had become, prices went up and museum collectors rushed in to get specimens before they disappeared like the dodo. By 1907 the count had been reduced to seventy-seven. The Heath Hen Association was formed. The society arranged for almost three thousand acres of protected range for the birds. By 1916 their numbers had increased to two thousand.
>
> Then came a fire, a gale, and a hard winter, with an unprecedented flight of goshawks, and in April, 1917, there were fewer than fifty breeding pairs. The next year, when there was an estimated total population of one hundred and fifty, the heath hen range was invaded by several expert photographers who took motion pictures of mating behavior. In the face of this disturbance at a critical time, still a good year allowed the birds to increase and again spread over Martha's Vineyard. In 1920 three hundred and fourteen were counted; but thereafter a decline in numbers set in which was never stopped.

In spite of increased measures of protection, the census for the succeeding years were 117, 100, 28, 54, 25, 35. The last one seen was a banded male, in 1932. These facts clearly point out the folly of waiting until near extinction before preserving a species.

JAMES H. PANNELL

NUMBERING BOOK ILLUSTRATIONS

THE writers have a particularly good reason for agreeing *in toto* with the suggestions made in Lewis G. Westgate's article, "On Numbering Book Illustrations."[1] Eleven years ago we employed the principle now sponsored by Westgate of numbering tables and nomographs according to the page on which they occur.[2]

From the point of view of both author and publisher, more work is involved in numbering the table that is found on page 86 as Table 86. Comments we have received indicate that, from the reader's standpoint, this extra work is amply justified. We join with Westgate in hoping that an increasing number of authors will see that the figures, tables, etc., in their scientific texts and reference books are referred to by their page numbers.

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LIFE INSURANCE SALES RESEARCH BUREAU, HARTFORD, CONN.

JACK W. DUNLAP

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NEW WORDS IN SCIENCE

I WAS very much interested in a recent letter in SCIENCE by E. F. McDonald, Jr., discussing the new word, *Radionics*. As science editor of the College Standard Dictionary, now undergoing a thorough revision, it is a good part of my job to watch for, track down, estimate and define the hundreds of new terms being introduced into the various sciences, both theoretical and applied. Mr. McDonald's comments on *Radionics* sent me on a hunt through various current sources, but with disappointing results. I have not succeeded in finding the word in actual use in the few technical journals I have seen, including the *Review of Scientific Instruments, Science News Letter,* the *Journal of Chemical Education* and a number of recent books.

I wonder if any of your readers could supply me with further information on the origin, date of first use, originator, range of usage, etc., regarding this very expressive term? The status of the men who favor it over *electronics* (which I still find used rather extensively) suggests survival value and naturally I am anxious to see that it has the proper rating in our dictionary, along with a respectable number of other new terms, such as *vitamer, betatron, tectonophysics, paleopedology* and *geotechnology.*

It has long seemed to me that both scientist and layman would be greatly benefited by a more intelli-

[1] SCIENCE, 96: 581, December 25, 1942.

[2] J. W. Dunlap and A. K. Kurtz, "Handbook of Statistical Nomographs, Tables, and Formulas." World Book Company, vii + 163 pp. 1932.

gent and comprehensive treatment of what I like to call the language of science. Especially does this seem desirable in the general dictionary, as distinguished from the many technical glossaries accessible to—and often understood only by—trained specialists. In my personal files, as well as in the master files in the Funk and Wagnalls reference department, are hundreds of cards dealing with this field of knowledge alone. The material, indeed, is so rich, and it accumulates so rapidly, that I have been encouraged to compile a sort of annual glossary of new (or relatively new) scientific and technical terms, the first modest instalment of which appeared in the 1943 edition of the *New International Year Book*.

I hope that some of your readers with a flair for the terminology and nomenclature of the sciences may feel prompted to comment on the points raised in this letter, possibly even contributing such new terms as they consider important for the proper understanding of new developments in their own fields. It is true, as Faraday sensibly remarked, "that names are one thing and science another"—but was it not Faraday who gave us *electrolyte, anode, cathode, electrode, ion?* And, despite Mr. McDonald's plea for *radionics*, how large is the language-debt of science to Johnstone Stoney's fertile neologism, *electron!*

HAROLD WARD

NEW YORK, N. Y.

NATIONAL LEARNED SOCIETY GROUPS

IN my article "National Learned Society Groups" (SCIENCE, May 7), by some slip of the pen, I inadvertently mentioned the Geological Survey, intending to cite one of the Government Bureaus specifically mentioned before a House Committee by Secretary of the Interior Ickes. Actually the Survey is one of the few departments requiring of its staff, I am now told, a written statement of freedom from any paid connection with private corporate interests. I have been assured that this measure is strictly enforced, requiring rigid devotion in scientific matters connected with geology to the national interest. If all scientific departments of the nation and of the separate states, together with all colleges, universities and technical schools had this freedom from any private corporate connection my proposals would be superfluous.

Permit me to say that I have had scores of letters of approval and a score of interviews with supporters of my propositions; these include men in practically all the larger Eastern institutions as well as many in state universities, government bureaus and even from the far-off Oriental Institute of Oriental Studies in the Hebrew University of Jerusalem.

There have been four letters in opposition. I note that none of the objectors mention whether they have such paid connections with corporations.

LOUIS C. KARPINSKI

SCIENTIFIC BOOKS

SAMUEL F. B. MORSE

The American Leonardo. A Life of Samuel F. B. Morse. By CARLTON MABEE. 32 and 380 pp. New York: Alfred A. Knopf. 1943.

FROM the brilliant introduction by Professor Allan Nevins to the final of the 380 pages by the author the reviewer found this to be a highly interesting and informative book. The 1875 "official" biography by Prime (nearly 800 pages) is very largely filled with long letters by or to Morse and with copies of documents bearing on the story of the telegraph. But in this book the author has seized upon the salient points of many letters and documents even more than were known to Prime and, with occasional quotations, has painted a portrait rich in color, accurate in detail. Every important statement concerning Morse is documented; that is, a reference to the original source is given so that the reader may, if he wishes, verify its accuracy. These references (40 pages at the back of the book) number about 740, but one reference may contain a list of several sources so that the total number of documents to which the reader may refer runs into the thousands. However, there is unity, continuity, alluring appeal and literary excellence in the body of the book.

This is more than a biography of Morse; it is a story of his time. For here we get glimpses of many of the prominent men with whom Morse had contact: His father, the Reverend Dr. Jedediah Morse, the stern, just Congregational minister, the author of the first American geography, a founder of the American Board of Foreign Missions, projector of the Andover Seminary; the foremost painters Stuart, Copley, West, Trumbull; the foremost scientists Silliman, Day, James Freeman Dana, Oersted, Ohm, Henry, Wheatstone, Arago, Ampere; the writers, Coleridge, Bryant, Cooper; the inventors, Whitney, Fulton, Daguerre, Steinheil; the statesmen, President Monroe, many members of Congress, Lafayette. We follow Morse as a struggling painter with a great ambition to paint historical scenes but compelled by poverty to paint portraits, at times, 14 hours a day. In the book there are sixteen excellent reproductions