to meet in conference with one from the Navy Department and together to consider the whole question, especially the equipment of the expedition, the financing of it, etc.

It is highly probable if the expedition should be carried out and should prove its value, such research work would almost of necessity become a permanent feature of the Department's activities; since recently acquired knowledge of the sea-bottom within the Pacific and Caribbean regions indicates that there exist a number of extended narrow zones close to the island groups within which there is an altogether exceptional instability, and that within these zones *vigias*, or before unknown perils to navigation, make their appearance. It will be necessary for this reason to repeat soundings within such regions at intervals of a decade or so, and in any case after seaquakes have been registered in their neighborhood. It is certain that science will be vastly extended through the making of such a map of the sea-floor as is here proposed.

Inasmuch as general meetings of the scientific bodies will generally not be held before the next Christmas holidays, it might be well for those scientific bodies whose advice has been requested to act either through their councils or through their instructed presidents in making their reply to the inquiries received.

WILLIAM HERBERT HOBBS
UNIVERSITY OF MICHIGAN

PHOSPHORESCENCE OF AMERICAN ICELAND SPAR AFTER RADIUM RADIATION[1]

SUBSEQUENT to some experiments in the radiation of calcites by radium, made at the request of Professor Wm. P. Headden, the results of which have been recently reported by him,[2] the writer had occasion to observe the phosphorescence and especially the remarkable thermophosphorescence of American Iceland spars.

Specimens from Greycliff, Montana, Cedarville, California, and one from Nevada[3] were radiated. As far as the preliminary observation showed, all behaved identically.

The phosphorescence is reddish-orange, of deeper hue than that of kunzite, is of about the same brilliancy at ordinary temperature, but becomes more brilliant than kunzite on raising the temperature of both. Professor R. E. Nyswander, of the University of Denver, with the cooperation of the writer, will make a study of the thermophosphorescence of Iceland spar from Montana by the new method reported at the recent meeting of the American Physical Society in Cincinnati.

Professor Headden further states[4] that the phosphorescent phenomena of the Montana Iceland spar under X-radiation are the most brilliant that he has observed for any mineral.

S. C. LIND

[1] Published by permission of the Director, U. S. Bureau of Mines.

[2] Headden, Wm. P., *American Journal of Science*, Vol. VI, Sept., 1923, pp. 247–261.

[3] The exact locality was not disclosed by the owner.

COLUMNAR HOLES

IN an article in SCIENCE for June 22, Mr. J. W. Harshberger explains the cause of the columnar holes in the wandering sand dunes of New Jersey. His explanation entirely confirms my own observation and conclusion as to the origin of like holes which I have found all around the shores of Bermuda in the solid rock bordering the sea. As is well known, the whole of the visible portion of those islands, and down to a depth of seven or eight hundred feet, has been built up by dunes—not of sand, but of the minute fragments of the calcareous skeletons of plants and animals which inhabit these waters. This substance, which is much lighter than sand, has been blown from the beaches upon the land and of course around the trunks of the trees. The rain brought down carbon-dioxide from the air. This dissolved some of the lime, which evaporating made a solid crust of rock about the body of the tree. Subsequently the tree died and decayed and left a cylindrical hole in the rock. They are found all along the shore and vary in diameter from a few inches to two feet or more.

In one of these holes I once found the top of the old stump, which had resisted the waves and the weather for one knows not how many centuries and was still solid wood and very hard. I contrived to chip off some pieces and put a thin section under the microscope, comparing it with a like section of a living juniper tree, a species which makes up, I suppose, 95 per cent. of our native forest, and found the structure the same. I afterwards submitted the specimen to an expert in wood structure and he positively confirmed my conclusion.

A. B. HERVEY
BATH, MAINE

THE TERM "ARROSTIC"

BASING his criticism apparently only on a few lines of an abstract of a lecture that I gave before the Palaeontographische Gesellschaft in 1923, R. Moodie objects in SCIENCE (Vol. LVIII, Nov. 2, 1923) to the use of the term arrostic.

He is evidently unacquainted with my paper on this

[4] Private communication.

subject that appeared in the *Anatomischer Anzeiger* (Nr. 15/16, 1923) and with the more extensive paper on the same subject published in Palaeontografica (1923). I therefore regard his objections to the use of the term arrostic as invalid.

BARON FRANCIS NOPCSA

QUOTATIONS

GOVERNMENT PUBLICATIONS AND THEIR DISTRIBUTION

WHEN a government takes in its own hands the publication of matters of scientific interest, it may be assumed that this is done with three distinct objects in view. In the first place, it wishes to bring to the notice of scientific workers the results of original researches carried out by experts in departments under its control, in order that these results may form a foundation for further advance in knowledge. So are published the papers comprised in the excellent scientific reports of the Ministry of Agriculture and Fisheries in England, and of the Fishery Board for Scotland. Or it desires to bring to the notice of the public, for the sake of the individual and through him of the nation at large, the condensed wisdom of science as bearing upon matters of practical importance. Such is embodied in the pamphlets and leaflets dealing with agricultural pests and plant diseases, with methods of land-cultivation and stock-raising, issued by the Ministry of Agriculture and Fisheries and the Board of Agriculture for Scotland. Sometimes these two aims are seen to run side by side, as in the Journals of Agriculture published both by the English Ministry and Scottish Board, in which matters of both scientific and practical interest appear.

The third object is very different from either of the above, its end being to inform the outside world, scientific and non-scientific, regarding the activities of institutions in which a general interest is taken; it takes its typical form in the annual reports of such establishments as the British Museum, the Natural History Museum, and the Royal Scottish Museum. This last object may seem to have little of scientific value to commend it, but it is in reality of prime importance; for institutions of the kind mentioned depend for many of their most valuable acquisitions upon the generosity of the public, and unless public interest is stimulated by full knowledge of progress and requirements, the national collections, and science, must in the end suffer.

The duty of scientific publisher assumed by the government does not end, however, with the printing of pamphlets, nor are its aims thus attained; the question of distribution is second only to that of printing, and it is to this that we wish particularly to direct attention. Every scientific worker is aware of the generous and even lavish free distribution of scientific publications carried out by government departments of the United States of America; and one is tempted to speculate whether the activity and originality of research now apparent there may not be due in part to this sustained appeal to the scientific mind.—*Nature.*

SCIENTIFIC BOOKS

Eclipses of the Sun. By S. A. MITCHELL, professor of astronomy at the University of Virginia and director of the Leander McCormick Observatory. Published by the Columbia University Press. Pp. XVII + 425, with 59 illustrations.

THIS is far more than a book on eclipses of the sun. It deals also with chronology, history, travel, spectroscopy, atomic theories, ionization and relativity, all presented in non-technical language, so it will be as interesting to the layman as to the scientist.

The author states that he has traveled more than 40,000 miles to witness four total eclipses of the sun and that the total time afforded him for scientific observations was less than eleven minutes. This illustrates the modern astronomer's idea of the importance of the observations of the sun during a total eclipse.

Up to about the middle of the nineteenth century an eclipse was observed only if its track happened to pass over the home of the observer and the observations made were simply the times of contacts and crude sketches of the corona. Now, whenever a total eclipse of the sun occurs anywhere short of the polar regions, many expeditions are sent to the narrow path of totality to take advantage of the few precious minutes during which the moon completely covers the sun. Professor Mitchell devotes several fascinating chapters to his personal experiences on four such expeditions.

The first two chapters of the book give an account of early eclipses and the part they have played in fixing historical dates, the earliest date thus determined being October 22, 2137 B. C.

Subsequent chapters trace the evolution of ideas in regard to the cause of eclipses, their prediction, the motion of the moon; size, shape and distance of the sun; sun-spots and their periodicity; the evolution of the spectroscope and its application to solar eclipse problems. Of these problems, two stand out conspicuously above all others in this book, *viz.*, the "flash spectrum" and the corona. These are of special interest at the present time in connection with their bearing upon the interpretation of spectra, the quantum theory, the structure of the atom and ionization.