and the brighter "pointers" of the dipper. The groups did not flash simultaneously with each other, but their rate, like that of the independent individuals, was very uniform—20 or 21 flashes to the minute. The groups would remain clearly defined for two or three minutes, each one drifting slowly and horizontally in its own direction at a height varying from 10 to 25 feet above the ground. They would then disintegrate, their members gradually "falling out of step" with each other. Not all the fireflies of this species in sight flashed with the groups—some were always showing their lights independently—but the great majority of those in a given area would temporarily band together.

At Pepper, in the Santa Cruz Valley, St. Elizabeth, on the evening of March 21, 1931, I saw two individuals, apparently of this same species, flying straight ahead across a common at a distance of about 20 feet from each other and 6 feet above the ground. While I watched them they flashed in perfect unison 14 times at intervals of about 3 seconds. They then disappeared behind some shrubbery. I did not measure the distance traversed in this way, but according to my recollection it could not have been much less than 100 yards.

Though I have no suggestion to offer regarding the cause of either of these types of simultaneous flashing I can not believe that they are to be explained as responses to females in the grass. Superficially, at least, they present an analogy with the simultaneous movements of birds in a flock or of fishes in a school.

GERRIT S. MILLER, JR.

U. S. NATIONAL MUSEUM

SCIENTIFIC MEN AND THE NEWSPAPERS

MORE important than any of the achievements of science are the philosophical implications of its discoveries—the need for leadership in thinking, leadership in the social and economic applications of the discoveries. In this leadership scientists are not prominent. Their failure to guide the public in adjusting the problems of plenty which the scientists have created may account largely for our economic and social crisis. This failure is due largely to the fact that the scientists have been keeping out of the newspapers, out of the place where the public can get acquainted with them, out of the place where the masses make up their minds what kind of leadership to follow.

The failure is mostly due to a mechanical maladjustment, to the fact that the scientists do not speak the language of the newspapers, that is, of the national forum. That language requires emotional appeal. For we are interested mostly only in those things which stir our emotions. We are likely to act only when our emotions are aroused.

The leaders of national thought take this emotional factor into account. If scientists did likewise, the public would listen to their message. It is because they have not done so that we see such an amazing situation as the attempts to solve unemployment without applying the first principle of science, which is to measure the precise dimensions of a problem. Because this principle is not understood, no one has taken an exact census of the unemployed.

The same lack is apparent in proposals to establish social security, such as old age pensions and unemployment insurance. The lack rises from the fact that the people as a whole have no adequate realization of the nature of the scientific approach.

They lack this realization because the scientists have not been telling in the newspapers the story of the frequently dramatic results of using the seemingly prosaic scientific approach. Much can be said on both sides as to why the scientists have kept out of newspapers. But I do not think there is any question about the harm done by the long years of scientific aloofness.

Honesty is the great need in guiding a baffled nation. I know of no place where all the principles of honesty, intellectual and moral, are so rigidly and openly spread as in the publications which scientists write for each other. These models the public almost never sees. The scientific riddles which are solved through this kind of honesty the public hears of only infrequently. Unless the public is to remain ignorant, and do so to its great harm, the place to tell about these scientific achievements and their implications is in the daily newspapers.

HOWARD W. BLAKESLEE,
Science Editor

THE ASSOCIATED PRESS
NEW YORK

BIOLOGICAL ABSTRACTS

WE believe that there are many zoologists who, like the writer, unconnected with *Biological Abstracts,* have heard with dismay of the reported decision of the Rockefeller Foundation to discontinue its support of that journal. Through a period of more than eight years we have become accustomed not only to lean heavily upon the *Abstracts* for information in our own fields of research, but also to use it for the revision and strengthening of our lecture notes in fields more remote. In the preparation of the latter we have become acquainted with many books and articles of which we would otherwise have remained totally ignorant. The titles of many biological publications are woefully inadequate in giving a true idea of their contents, and he who depends upon titles misses many sources of pertinent knowledge. The reading of the

best abstract, to be sure, falls short of the gain acquired by reading the article or book abstracted, but an abstract is better than complete ignorance of the publication concerned. Time in which to read all the originals is lacking with most teachers, who strive also to investigate. The cessation of the *Abstracts* would, therefore, mean loss to institutions and to their staffs in the value of both instruction given and research accomplished. We believe that the use of the *Abstracts* has brought home to us a realization that each volume, with all the advantages just hinted at, is really of much greater value to each of us, as individual teachers and investigators, than the nine dollars we have been paying for it each year. From the combined teacher-investigator standpoint, we, therefore, should look on the abandonment of the *Abstracts* as a distinctly backward step in biology. The wider view and the coordination of the various fields of biology which the *Abstracts* has made possible are indispensable. We trust that every effort will be made to secure adequate support for its continuance. We suggest that those who share our thoughts will, each, as far as his individual means allow, establish his own higher rate of subscription, thus showing, at the same time, his appreciation of the benefits which the *Abstracts* confers upon him. The *Abstracts* exists primarily for biologists, and it is the biologists who must largely determine whether it is to be continued or not.

PHILIP P. CALVERT
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REPORTS

APPROPRIATIONS FOR GRANTS-IN-AID BY THE NATIONAL RESEARCH COUNCIL

AT its May, 1935, meeting, the Committee on Grants-in-Aid of the National Research Council made seventy awards as follows:

Physical Sciences: Sebastian Albrecht, research associate, Dudley Observatory, "stellar wave-lengths and standard radial velocities"; J. A. Bearden, associate professor of physics, Johns Hopkins University, "a repetition of the Millikan oil-drop experiment and a redetermination of the electronic charge"; Lee A. Dubridge, professor of physics, University of Rochester, "the photoelectric effect in the extreme ultra-violet"; Joseph Kaplan, assistant professor of physics, University of California at Los Angeles, "interpretation of the Aurora spectrum"; Gleason W. Kenrick, visiting professor of physics, University of Puerto Rico, "radio transmission with particular reference to phenomena peculiar to tropical latitudes"; M. Stanley Livingston, instructor in physics, Cornell University, "nuclear investigations"; J. Rud Nielsen, professor of theoretical physics, University of Oklahoma, "Raman spectra of simple polyatomic molecules"; T. Smith Taylor, professor of physics, Washington and Jefferson College, "development of a standard method for the measurement of the power factor of insulating materials over a frequency range of one megacycle to one hundred megacycles"; Samuel R. Williams, professor of physics, Amherst College, "inter-relations of magnetism and mechanical hardness"; Richard S. Zug, assistant professor of mathematics and astronomy, Drake University, "galactic star clusters."

Chemistry: Richard McL. Badger, assistant professor of chemistry, California Institute of Technology, "the spectra of the simpler polyatomic molecules in the photographic infrared"; James A. Beattie, associate professor of physico-chemical research, Massachusetts Institute of Technology, "relation of the International Temperature Scale to the absolute scale in the range from the freezing point of water to the boiling point of sulphur"; A. Witt Hutchison, assistant professor of chemistry, Pennsylvania State College, "measurement of heat capacities at temperatures attainable with liquid helium"; H. I. Schlesinger, professor of chemistry, and W. C. Johnson, associate professor of chemistry, University of Chicago, jointly, "the hydrogen compounds of boron, silicon and arsenic, and their derivatives"; Nelson W. Taylor, professor of ceramics, Pennsylvania State College, "activation energies in solid phase reactions involving the various polymorphic forms of silica"; Arthur A. Vernon, instructor in physical chemistry, Rhode Island State College, "solubility of electrolytes in non-aqueous solvents"; Roger J. Williams, professor of chemistry, Oregon State College, "the chemical isolation and study of pantothenic acid."

Geology and Geography: Charles Deiss, associate professor of geology, University of Montana, "stratigraphic and paleontologic studies of the Cambrian formations of Montana and Wyoming"; Donald McCoy Fraser, assistant professor of geology, Lehigh University, "petrogenesis of the crystalline rocks in eastern Pennsylvania"; Elbridge C. Jacobs, professor of geology, University of Vermont, "installation of a seismograph for the completion of the seismographic station at the University of Vermont"; K. C. McMurry, professor of geography, University of Michigan, "development of methods for utilizing aerial photography in land inventory and classification"; Oscar B. Muench, professor of chemistry and physics, New Mexico Normal University, "determination of the age of samples of monazite and thucholite from Glorieta, New Mexico"; F. J. Pettijohn, assistant pro-