LETTERS

Fire Ant: Whose Pest?

In presenting the rationale of the Agricultural Research Service toward pest control ("Agricultural pest control and the environment," 19 June, p. 1419), Irving states that "persistent pesticides should be released into the environment only when necessary—that is, when the need is immediate to protect human health or life-supporting food supplies and when no satisfactory alternative is available." I contend that the logic and good intentions of this statement are violated by the current fire ant eradication program. The ARS and cooperating state agencies plan to treat 120 million acres in nine southeastern states three times with 1/4 pounds of Mirex bait per acre per treatment.

How is this program justified in terms of protecting human health and food supplies? Imported fire ants have seldom been reported to be detrimental in their feeding. Insects, insect products, and other animals form the major portion of the fire ant diet (1). Mirex, however, is a very stable and persistent chlorinated hydrocarbon (2) and is known to induce tumors in mice (3). The Mrak Commission (3) has recommended that the exposure of human beings to such carcinogens be minimized and that the use of such compounds be restricted to those purposes for which they are judged to be advantageous to human health which outweigh the potential hazard of carcinogenicity.

If the ARS is really interested in the environment, they should stop this eradication program and recommend individual mound treatments which effectively control fire ants (1). Surely we can find a better way to spend $200 million.

Denzel E. Ferguson
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References
1. H. B. Green, The Imported Fire Ant in the Southeastern United States, Mississippi State Univ., Agricultural Experiment Station Bulletin 737 (1967).

The imported fire ant is less significant as an agricultural pest than it is as a "people pest." But the people who are affected by it regard the nuisance and the adverse effect upon their health and well-being of sufficient importance to demand relief from it.

As Ferguson knows, the fire ant eradication program is a program of the states in which the federal government is a participant. Federal participation was authorized by Congress in response to demands from the infested states—demands which continue at the local level and through state representatives in Congress. Objections to continuation of the program would have greater weight if they were expressed persuasively to the states concerned. Nevertheless, the federal government does significantly influence the operation of the program. Our 8-year field experience in using Mirex to control the fire ant has included consideration of the possible hazards of the chemical to man and his environment. This experience does not indicate that we should abandon Mirex. Ferguson notes that 1/4 pounds of Mirex bait is applied three times per acre. This 3 3/4 pounds of bait contains only 5.1 grams of the active chemical and represents an almost unbelievably low amount of toxicant to achieve the high level of effectiveness we have experienced. We believe the continued prudent and systematic use of this tool will eradicate the pest. It will be costly, but it is also costly to live indefinitely with the pest, which is the alternative course suggested by Ferguson.

George W. Irving, Jr.
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Department of Agriculture,
Washington, D.C. 20250

Computers as Chess Partners

The cover of the 10 July Science is timeless, but its caption, in the table of contents, is badly dated. The "future" to which it refers, in which "it may be possible to develop computer programs for chess play," began in 1957–58 when Alex Bernstein constructed the first complete chess-playing program for a computer. This and other early programs (including some hand-simulated predecessors) have been published (1).

No program yet plays expert, or even Class A, chess, but Greenblatt's program, perhaps the strongest in the field today, has won a Class C American Chess Federation rating on the basis of its performance in tournaments.
(against humans). This would place it, I am confident, well above the median strength of Science-reading chess players.

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Reference

Revising the Publication Process

Contrary to Woodford (Letters, 12 June), Brown et al. (1) did not propose putting scientific articles on microfilm and providing “hard copies” only on request. Instead we argued specifically against such an idea and proposed a change in the form of journal distribution.

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Reference

Woodford’s basic points on “Inflexible page charges” are very well put. However, his remarks that editions of journals in microform or microfiche “remain cumbersome to read or consult” seem to be a personal opinion. Our experience here, confirmed by others in industrial-research laboratories, has demonstrated that editions of primary and secondary journals in the form of 16-mm microfilm in cartridges are easier to use than bound volumes of journals, save readers up to 50 percent of their time as against the use of bound journals (including making copies on microfilm reader-printers), and are popular with researchers who do their own information studies. Some hundreds of libraries have already replaced their bound volumes of Chemical Abstracts with the microfilm edition in cartridges, and the number of primary journals becoming available in this format is increasing rapidly. Woodford’s experience must have been based on the use of 16-mm microfilm reels not in cartridges. For these, “cumbersome” is a mild term.

BEN H. WEIL
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Suggested Reading on the Environment

Estuaries

The development of coastal areas has been very rapid in recent years, but knowledge of estuarine environments has not kept pace with the necessity to resolve problems arising from their intensive use. This is the first comprehensive collection of scientific papers covering the comparatively new field of estuarine research.

This volume contains 71 articles on physical and biological factors, geomorphology, sediments and sedimentation, microbiota, ecology, evolution, fisheries, human influences and pollution.


Agriculture and the Quality of Our Environment

This symposium is basically concerned with the problem of how environmental quality affects agriculture, and how agriculture affects the quality of the environment. It identifies the part which science must play in solving environmental pollution problems.


Air Conservation

This is a report of deliberations of the Air Conservation Commission of the AAAS over a 2-year period. It pulls together into a single reference a wealth of information presented by authorities in the fields of conservation, pollution control, pollutants and their effects, law, economics, meteorology, public health, public opinion and government.

The Bulletin of the American Meteorological Society calls this work "the most thoughtful, realistic and penetrating analysis of air pollution as a factor in the societies of today and tomorrow now available. It is a must for the serious student and professional, and can be highly recommended to the interested citizen."


Oceanography

A collection of 30 papers presented at the first International Oceanographic Congress by world-renowned authorities. An interdisciplinary reference that deals with some of mankind's most profound questions . . . the origin and history of living things, for example, and the history of our galaxy as recorded in marine sediments.

are found in certain marine organisms; for instance, DDT residues in mackerel caught off the California coast exceed permissible tolerance levels for human consumption. A "drastic reduction" in use of DDT was urged. A program of base-line measurements of the concentration and effects of DDT in the oceans was also recommended.

- Up to 1.5 million tons of oil are introduced into the oceans every year through ocean shipping, offshore drilling, and accidents. In addition, as much as another 3 to 4.5 million tons of oil disposed of on land may be finding its way into waterways and eventually into the oceans. Available evaluations of the effect of oil on marine life are conflicting, some showing severe damage, others showing relatively little. More extensive research is required.

The summer study's working group on environmental monitoring, headed by George Robinson of the Center for the Environment and Man at Hartford, estimated that an effective global system for monitoring critical parameters could be established for about $25 million. This estimate, admittedly rough and tentative, assumes that existing weather stations and environmental institutes would become a part of the system. In many cases, the scope and competence of existing institutions would be broadened simply by the addition of special equipment and a few more people. Airborne monitoring would usually be accomplished by mounting the monitoring equipment on commercial aircraft.

The findings and recommendations of the summer study will be set forth in detail in a report to be published by the M.I.T. Press in October. Next spring, a series of edited volumes containing many of the background and working papers used in the summer study will be published. The study was financed by 11 federal agencies, five foundations, and M.I.T. director of the study was Carroll L. Wilson of M.I.T.'s Sloan School of Management and the Program for Social Application of Technology.—Luther J. Carter

Stanford Research Institute, to executive director, new SRI–Irvine Laboratory. . . . Walter K. Kuhn, professor of engineering and applied science, George Washington University School of Engineering and Applied Science, to chairman of the department . . . Cedric M. Smith, chairman, pharmacology department, State University of New York, Buffalo, has been named the first director of the new Research Institute on Alcoholism at the university. . . . John H. Morrison, professor of biology, Kent State University, to chairman, biology department, Cleveland State University. . . . Norman S. Cohn, chairman, botany department, Ohio University, to dean, Graduate College and director, Research Institute at the university. . . . C. Sharp Cook, head, radiation physics division, Naval Radiological Defense Laboratory, to chairman, physics department, University of Texas, El Paso. . . . W. H. Matchett, research fellow, Battelle Memorial Institute's Seattle Research Center, to chairman, botany department, Washington State University.

**RECENT DEATHS**

Robert L. Airth, 48; professor of botany, University of Texas; 7 July.

Avery A. Ashdown, 78; retired professor of organic chemistry, M.I.T.; 15 July.

Eric L. Berne, 60; psychiatrist and developer of transactional analysis; 15 July.

Leo W. Boulanger, 46; professor of entomology and director of research, University of Maine; 2 July.

Henry L. Cain, 76; founder and president emeritus, University of the Americas, Mexico City; 1 July.

Sydney Chapman, 82; former professor of geophysics, University of Alaska; 16 June.

Walter F. Colby, 89; former professor of physics, University of Michigan; 2 July.

Ellsworth Collins, 83; dean emeritus, College of Education, University of Oklahoma; 18 June.

David A. Cooper, 72; professor emeritus of medicine, University of Pennsylvania; 6 July.

Clarence B. Farrar, 96; retired chairman, psychiatry department, University of Toronto; 3 June.

Angus M. Griffin, 60; associate dean, George Washington University Medical Center; 24 June.

Leslie R. Groves, 73; director of the World War II Manhattan Project which developed the atomic bomb; 13 July.

Henry Guze, 51; psychoanalyst and adjunct professor of anthropology, Drew University; 2 July.

Robert W. Hull, 46; chairman, biological sciences department, Florida State University; 13 July.

George N. Jones, 66; professor of botany, University of Illinois, Urbana-Champaign; 25 June.

Carl F. Kayan, 70; professor emeritus of mechanical engineering, Columbia University; 5 July.

Paul L. Kirk, 68; retired professor of biochemistry, University of California, Berkeley; 5 June.

Albert B. Lauderbaugh, 66; retired assistant vice president in charge of research and development, Columbia Gas System, Pittsburgh; 4 July.

C. N. Hugh Long, 69; former dean, Yale University School of Medicine; 6 July.

Andrew A. Marchetti, 69; professor of obstetrics and gynecology, Georgetown University; 24 June.

Abraham Maslow, 62; professor of psychology, Brandeis University; 8 June.

Carl A. Moyer, 61; former director of research, Michigan Technological University; 29 May.

Carey G. Mumford, 67; professor emeritus of mathematics, North Carolina State University, Raleigh; 24 June.

Hortense Powdermaker, 69; retired professor of anthropology, City University of New York; 16 June.

Carl F. Pruttun, 71; retired head, chemistry and chemical engineering department, Case Institute of Technology; 15 July.

Eva J. Ross, 67; retired chairman, sociology department, Trinity College, Washington, D.C.; 3 July.

Zevi N. Salsburg, 41; professor of chemistry and mathematical science, Rice University; 20 June.

Mikhail Shemyakin, 62; founder of the School of Biochemistry, Soviet Academy of Sciences.

Herbert A. Siegel, 47; professor of psychology, Towson State College, 20 June.

R ichard Spear, 49; professor of education, East Carolina University; 4 June.

Thomas B. Symons, 89; retired dean of agriculture, University of Maryland; 4 July.

Charles K. Welchtet, 67; former dean, College of Arts and Sciences, University of Cincinnati; 20 June.

**APPOINTMENTS**

Eric A. Walker, retired president, Pennsylvania State University, to vice president for science and technology, Aluminum Company of America. .

Edward C. Wood, director of applied programs, physical sciences division,
tures, such as textures and mineral associations, described in the book. The quality of the translation is generally good, sometimes awkward where the translation has been excessively literal, but rarely incomprehensible.

The section of the genetic classification is heavily slanted toward the igneous origin of ores and ignores the recent work on sedimentary origins. There is little effective use of physical chemistry in the discussion. Except for the part on metamorphism, which is more worthwhile although qualitative, the material in this section is not significantly different from similar material in textbooks of economic geology published 25 years ago.

The true worth of the book appears in the section on ore textures. The author is the outstanding man in this field, and in writing this section he has drawn heavily on a specialized experience and personal observations made over a span of 45 years. The section is illustrated with more than 250 figures, consisting mainly of well-documented photographs of textures described in the text. The additions, corrections, and other changes that have been made for the English edition lie mainly in the areas of the author’s greatest competence and special interests. Some of the material in the book is therefore now at least 12 to 15 years out of date. This is particularly evident in the final section, which sets out to give a systematic description of the ore and gangue minerals. The discussions of physical chemistry and paragenetic position take little account of recent experimental work. For example, the phase diagram for the system Cu₂S-CuS (which is one of the few phase diagrams found in the book) was derived in 1941. The opportunity was not taken to systematically update the powder x-ray data, and the data of Harcourt (1942) are still given for some common minerals. No use is made of known relations, in some mineral groups and series, between chemical constitution and lattice dimensions to define composition. On the other hand, the author’s continuing study of ores in polished section and his interest in developing improved polishing techniques have resulted in more than a hundred new and replacement photographs in this section.

This book is not a modern text in mineral deposits geology. I find it disappointing that the prominent scientists listed as translators did not do more to modernize the subject matter in these areas in which they themselves are so well qualified. On the other hand, no one with a serious interest in ore minerals can afford to be without the book. It is and will remain the classic reference work in ore microscopy and is a tribute to one of the world’s greatest ore microscopists.

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Books Received


xxiv + 342 pp., illus. + teacher's guide. Paper, $5.95.


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