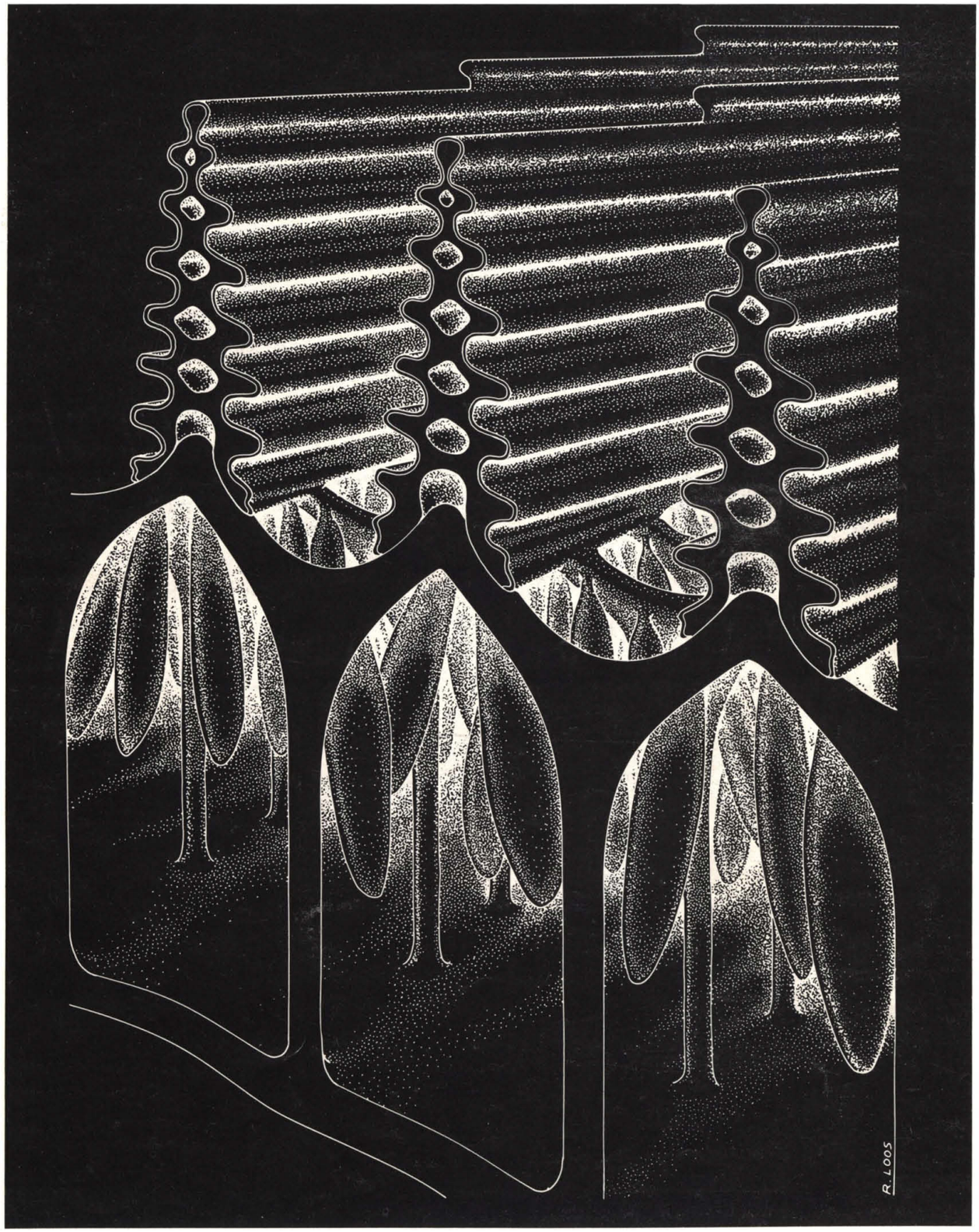
SCIENCE 15 December 1972
Vol. 178, No. 4066
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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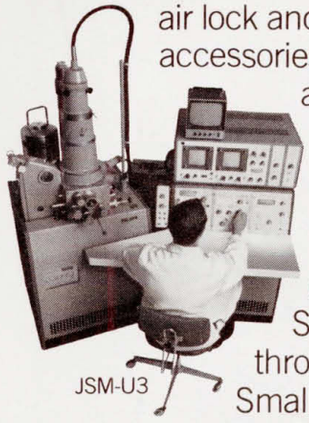

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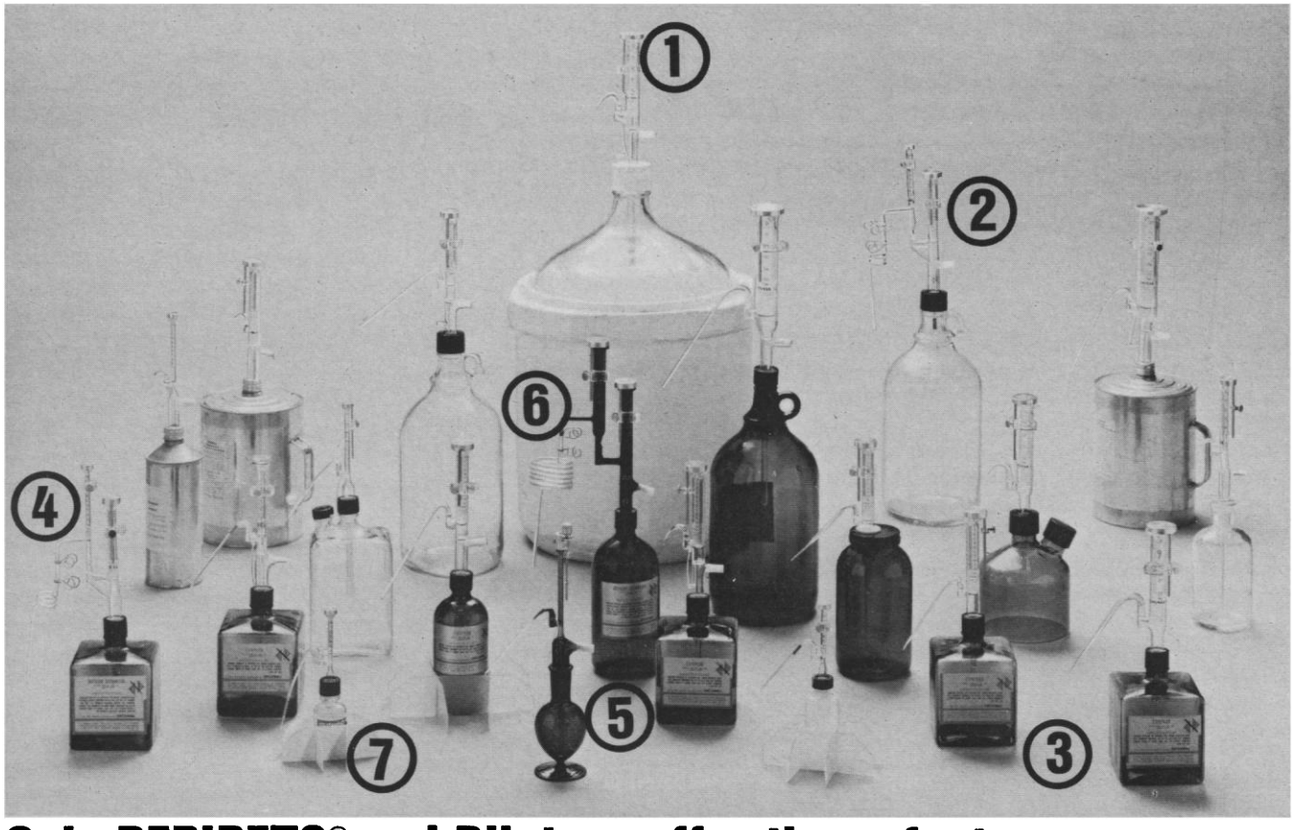

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SCIENCE

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COVER

Portion of an ultraviolet-reflecting wing scale of the butterfly *Eurema lisa*. The ultraviolet reflection is structural rather than pigmentary, and is caused by optical interference in the lamellar system associated with the ridges that project upward from the scale. See page 1214. [Diagram by R. Loos, State University of New York at Albany]

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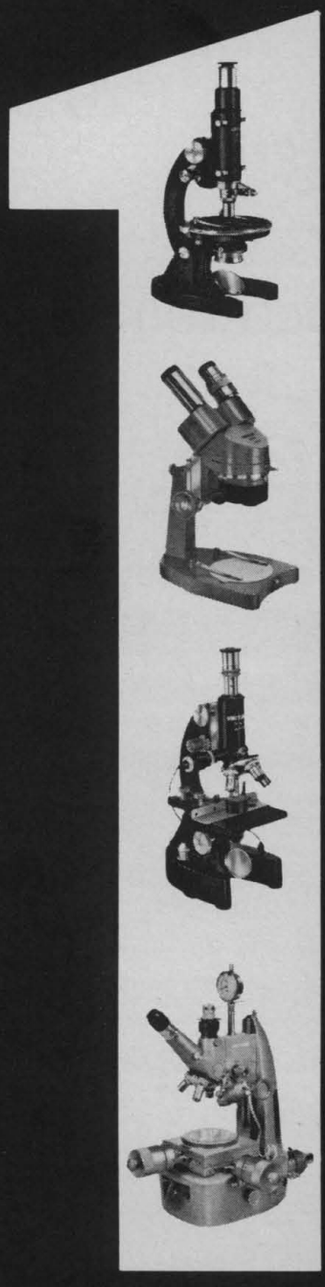

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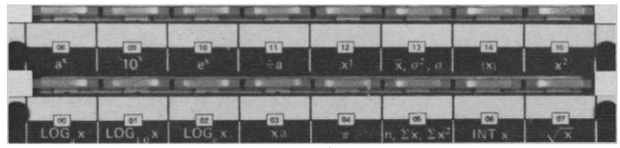

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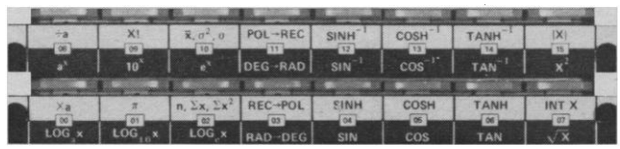

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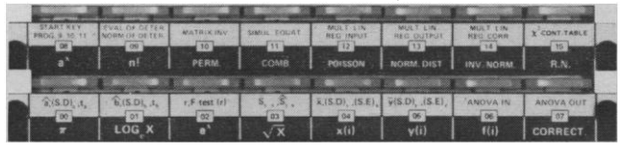

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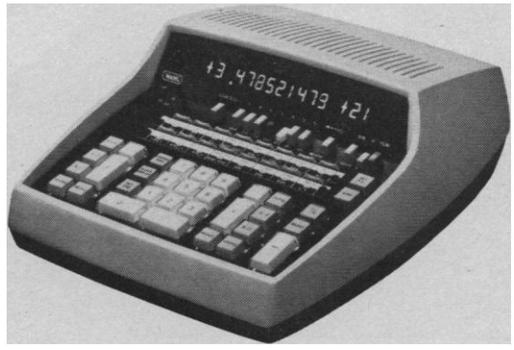

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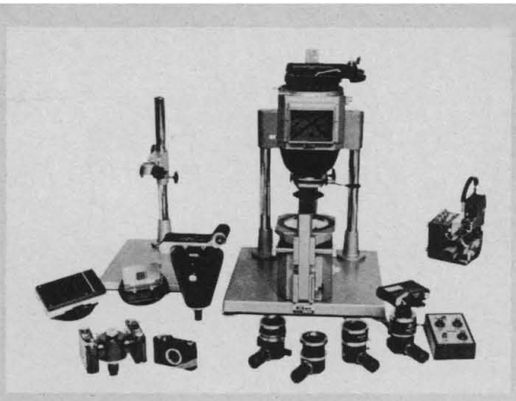

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HAMILTON

Amazon Basin as we do about the mallard duck." "We" doubtless includes Raven, Berlin, and Breedlove, but does it include anyone else?

They continue, "It is often argued that, if we know about the systematics of a particular group of organisms in detail, we will be better able to utilize them in biological control programs. . . . What we have achieved in biological control . . . has been almost entirely the result of ad hoc studies of the problems when they become of interest. . . ." In fact, the vast majority of biological control programs have ended in partial or complete failure. A striking example of the importance of taxonomic discrimination in biological control is presented by DeBach (*1*).

Finally, Raven *et al.* conclude that "Taxonomic work has helped us only to a limited extent in understanding the functioning of ecosystems. . . ." Thinking that I may have been living in some sort of dream world, I reexamined the major works of such ecologists as Elton (*2*) and Odum (*3*), who confirm my own impression that determining the composition of the community in terms of organisms and their life histories and dispersal powers, and so forth, is a basic initial step in any analysis of ecosystems.

When new taxonomic methodologies are developed, as they surely will be, they will be more constructively realistic than those proposed by Raven *et al.*

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Cambridge, Massachusetts 02138

References

1. P. DeBach, *Ann. Entomol. Soc. Amer.* **53**, 701 (1960).
2. C. Elton, *The Pattern of Animal Communities* (Wiley, New York, 1966).
3. E. P. Odum, *Amer. Zool.* **8**, 11 (1968).

Raven *et al.* describe the development of pre-Linnaean and Linnaean methods of naming organisms. But they have not written one word about modern taxonomy, or is it modern taxonomy stripped of all its essential character which they discuss under "Problems for modern taxonomy"? We hesitate to accept this. Modern taxonomy is no longer the science of "giving names and nomenclature"; the final result of taxonomy will not be a list of all organisms, with their names, pictures, and full description. The final result has to be the understanding of the species concept, the genus concept, the family concept, and so forth, and the understanding of the relation and interaction between species or between genera. The origin of the species and not the origin of species, the development of the taxon and not of taxa are the special interests of modern taxonomists. They do not study the difference between species, but the difference between the species concept in different groups of animals.

It is impossible to describe all the species existing today. However, it is possible to describe certain taxa and to come to the understanding of these taxa, which in the future will help us understand the concept and meaning of the taxon.

Modern electronic equipment can indeed assist the registration and distribution of data concerning the taxa, but taxonomy can do nothing without the help of other disciplines, such as ecology, physiology, genetics, and anatomy.

Raven *et al.* deal with plant taxonomy; there are differences between plant taxonomy and animal taxonomy, but both branches of modern taxonomy are part of biological science, while the old taxonomy was probably more closely related to philately. Biology, the life science, the understanding of the development, adaptation, variability, and diversity of the most natural and original of all matter, is not dependent on, but culminates in, the science of taxonomy. As our environment must be protected against man by Man, it seems essential that we understand development (and disappearance), adaptation, variation, and diversity.

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The diverse points of view presented by the critics of our article bring into sharp focus the fundamental disagreements among taxonomists about classifying organisms, and even about what "taxonomy" comprises. Perhaps there are fewer than 10 million kinds of organisms in the world, but the order of magnitude is correct. Many of these organisms will become extinct, especially in the tropics, within the next 25 years, as the destruction of the tropical lowland forest becomes an event of global proportion. Some of these extinct organisms will have been named, others will not.

Only we, and not our successors, have the choice of what kinds of information to gather about a number of kinds of organisms, and the relations between them. The analysis of many tropical ecosystems will continue to be possible for only a few more decades, and the kind of monographic studies that might provide valuable comparative material for such analyses will not be completed for most groups of organisms in time.

There seems to us to be no a priori reason to assume that the taxonomic system we have inherited is the best or only one for dealing with this problem. It is a truism to say the world is changing rapidly, and the facts on which we should be basing our decisions are very different today from what they were a century, a decade, or even a year ago. Most of our decisions are based upon the implicit assumption that we live in a stable world, but we certainly do not.

Many modern tools are available for dealing with information, and we believe that systematists should, by virtue of the almost incalculable number of facts with which they are concerned, be among the first and not the last to adopt them. If, in the light of a careful consideration of the condition of the world as it is today, the magnitude of the task of the systematist, and the availability of many new tools for dealing with the diversity of nature, an individual taxonomist wants to keep on doing essentially what he and his predecessors have been doing for thousands of years, that is his decision; we, however, hope that at least some taxonomists will continue to seek more creative solutions to these problems. Special consideration should be given to gathering "unusual" kinds of data about particular aggregations of tropical organisms, rather than plodding ahead with the standard monographic approach for all groups regardless of size, importance in the ecosystem, or present knowledge of the group.

Perhaps sarcasm in the defense of the status quo is no vice, but if we want to consider the world as it is and make conscious, reasoned decisions about what kinds of information we shall gather and thus be able to transmit to our successors, it is not enough.

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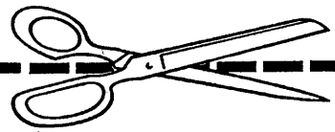
* Both of my coauthors are currently in the tropics engaged in field work and could not therefore join me in commenting upon the responses to our article.



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Come, Now, and Let Us Reason Together

The central program of the 1972 AAAS Annual Meeting, described in the 24 November issue of *Science*, gives some notion of the vitality and scope of the meeting and of the investment of human effort that it represents. Topics of seminal importance for science, for technology, and for the interplay between these and society are presented in depth by able people drawn from a variety of backgrounds and interests. The meeting serves numerous audiences—from bench scientists to members of the general public. It continues to serve the scientific community in such a way as to command the confidence and backing of the scientists of the country.

Most of the meeting's symposiums deal with the professional interests of scientists and engineers; but special efforts are directed toward the broader problem of the relation of science to society and toward communicating with the general public concerning science, technology, and social change.

There are, then, three principal purposes that the Annual Meeting seeks to serve: to give in-depth presentations of important scientific and technical areas in such a way that they are of interest to a spectrum of disciplines; to present comprehensive symposiums on central scientific and societal problems whose treatment requires the knowledge and insights of a number of professions, both scientific and nonscientific; and to present programs designed to increase the public understanding of science and the ability to use science and technology for the promotion of human welfare.

Although the principal focus is upon advances in science, approximately one-third of the central program this year (nearly 30 symposiums) deals with science and social issues, including such topics as land-use controls, minorities in science, aggression and violence, prison research, behavior control, and genetic engineering. Within such a meeting, all reasoned and responsible views have a place. Most programs will incorporate an audience participation portion of significant length in which discussion from the floor is welcomed. Because the AAAS is committed to the open competition of ideas, arrangers of issue-oriented symposiums have been encouraged to include differing or conflicting viewpoints in their programs. In this way, constructive concern and criticism are increasingly represented in the formal program. Thus the AAAS provides a setting in which scientists can devote their energies to major social issues and can attempt, through their special expertise, to contribute to the solution of some of society's problems. A large portion of the meeting may be correctly viewed as a forum for the consideration of public policies involving science, and for the shaping of the contributions that science can make to the betterment of society.

In such a setting, disruption has no place. We welcome participants who use the meeting to bring ideas into confrontation; we condemn acts that deny others the opportunity to present their views or to engage in dissent. As an association, we shall take whatever steps we can to prevent this kind of interference. We believe that the effort to provide the scientific and technical community with the opportunity for full and free discussion of some of society's most pressing and difficult problems is one of the most important things we can do and is essential for the advancement of science.

The participants and others who attend our meetings should be protected from the mischief of disrupted meetings; and the public, who are informed of the proceedings by an able corps of science writers, should not have its right to know interfered with.

There will always be a place within the AAAS Annual Meeting for thoughtful and emphatic dissent. There is no place for the activities of a self-selected few who would prevent the views of others from being heard.—MINA REES, *Chairman, AAAS Board of Directors*

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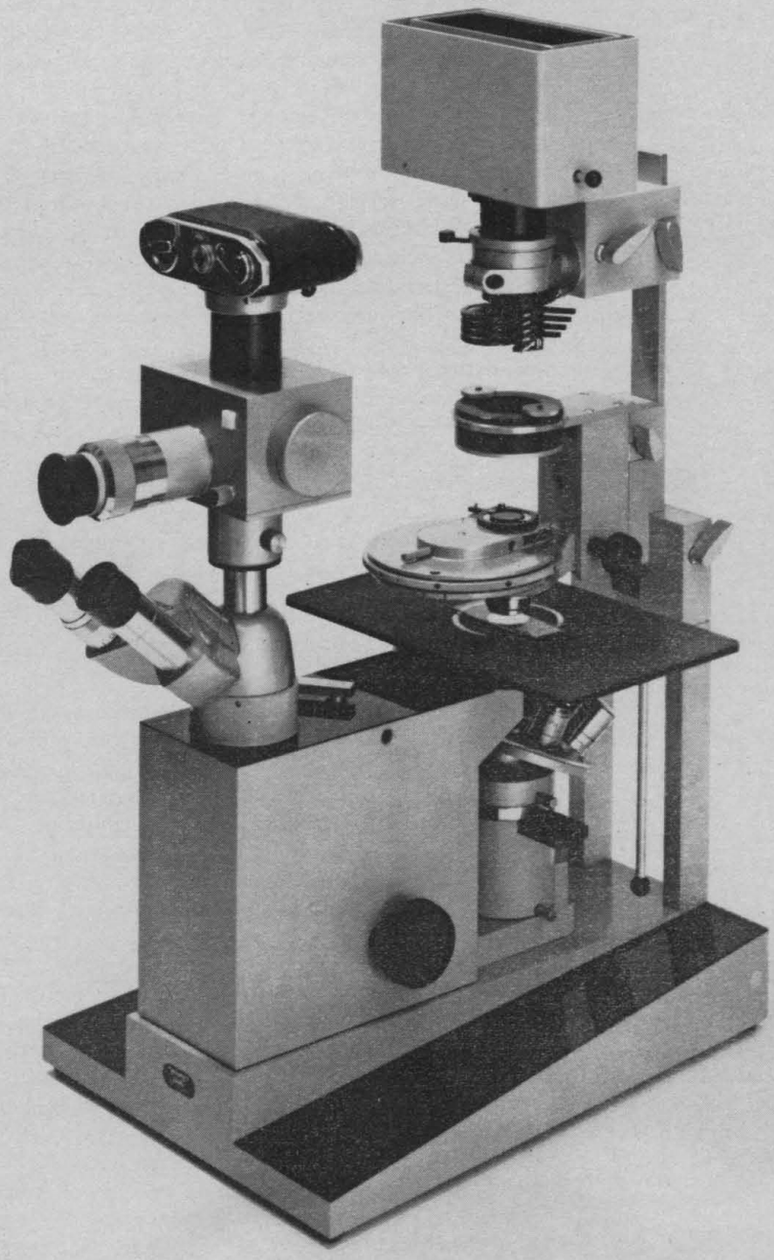

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(Continued from page 1164)

illus. $10.25. Oxford Science Research Papers.

Determinants of Behavioral Development. Proceedings of a symposium, Nijmegan, The Netherlands, July 1971. F. J. Mönks, Willard W. Hartup, and Jan de Wit, Eds. Academic Press, New York, 1972. xx, 666 pp., illus. $24.

Digital Time Series Analysis. Robert K. Otnes and Loren Enochson. Wiley, New York, 1972. xii, 468 pp., illus. $16.95.

Drug Abuse and Drug Counseling. A Case Approach. Thomas Weisman. Albert Sattin and William T. Stickley, Eds. The Press of Case Western Reserve University, Cleveland, 1972. xii, 194 pp. Paper, $5.95.

The Ecology of Animals. N. P. Naumov. Norman D. Levine, Ed. Translated from the Russian edition (Moscow, 1963) by Frederick K. Plous, Jr. University of Illinois Press, Urbana, 1972. x, 650 pp., illus. $17.50.

Elementary Quantum Mechanics. N. F. Mott. Wykeham, London; Springer-Verlag, New York, 1972. viii, 122 pp., illus. Paper, $5.80. Wykeham Science Series.

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NEWS AND COMMENT

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developing countries, which have a special need for research and education in the environmental field.

If the General Assembly acts favorably, as expected, the next crucial question for the environmental program will be the response of the United States, or, more specifically, of Congress. The new U.N. enterprise is being proposed at a time when the United States—the major "donor" country—is having difficulties with both its international balance of payments and its balance of popularity. America's foreign economic policy and the operations of U.S. companies have roused resentment, particularly in some developing countries with intractable economic problems. Criticism of the United States has become almost a ritual in U.N. proceedings, and anti-U.S. feeling reached a sort of apogee in the expulsion of Nationalist China from the United Nations. The hostility of developing nations toward the United States has found its reciprocal in Congress, and many legislators have cast a cold eye on U.S. funding of the United Nations.

This autumn, the Administration has sought a reduction of the U.S. contribution to the U.N. operating budget, from about a third to a quarter of the annual budget. The recent acceptance of this adjustment at the United Nations had considerable significance, since rejection would have caused an exasperated reaction from Congress and would likely have prejudiced congressional attitudes toward the environmental program. The developing nations apparently recognized the relevance of the vote to the American contribution of about 45 percent of U.N. voluntary funds, which finance programs that are especially important to these nations.

American officials who handle dealings with the United Nations say that the congressional attitude toward the environmental program is by no means predictable. But they see encouraging signs in the fact that Strong has a good reputation and that the Nixon Administration apparently has a firm commitment to the idea; they also think the argument for an attack on global environmental problems is persuasive. Action on the U.N. environmental program will be a good indication of how Congress is reconciling itself to the evolving arrangements at the United Nations about paying the piper and calling the tune.—JOHN WALSH