

decision-makers framing national policy. The aquaculture group proposed better assessment of what species will soon be ready for cultivation, better communication and coordination on a national level, and establishment of aquacultural research stations.

In ocean engineering, the preponderant feeling was that Sea Grant is not accomplishing what it should. Specific suggestions were to establish cooperative programs in which students would move back and forth between university and industry, industrial sabbaticals for faculty, and cooperative research with industry. Almost all the sessions felt that committees should be set up to study further the potential contributions of Sea Grant and to coordinate Sea Grant efforts in the different areas.

David Potter, chief engineer of Delco Electronics and a former member of the National Sea Grant Program Advisory Panel, was highly critical of the program's accomplishments to date. Though he confessed that in a sense he was acting as a benevolent gadfly in offering his criticisms, he does feel that the program has not lived up to its potential.

Another conference speaker, Sen. Ernest F. Hollings (D-S.C.), one of Sea Grant's strongest Congressional backers, seems to see the program as a means of increasing the U.S. sea power. He warned conferees that the Soviet Union is ahead in the development of nuclear powered submarines and fishing fleets and the Japanese are ahead in exploiting the oceans' resources. "National security has been needlessly jeopardized," he says.

The Sea Grant Program is extremely broad, and perhaps therein lies the reason for misunderstandings as to what it can and should accomplish, as well as the reason it has gone relatively unhealed. For a young program with admittedly modest funding, the Sea Grant Program's record is impressive. But its contributions have been in the form of the small increments of knowledge that add to man's basic understanding of his environment rather than isolated spectacular achievements. Like the land-grant concept after which it is modeled, it aims at the direct involvement of scholars in the practical problems of the marine environment. And, as White pointed out, the program is just beginning.

Still, there seems to be a need for finer focus; Sea Grant may be spreading itself too thin. Marine problems are competing for public attention with many other pressing problems, and popular support is necessary for continuance of any program. Some Sea Grant spokesmen feel that sizable increases in funding will have to be made for Sea Grant to flourish. □

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DICTIONARY OF BIOLOGY—Edwin B. Steen—Barnes & Noble, 1971, 630 p., paper, \$3.95. Comprises approximately 12,000 terms with definitions presented in brief analytical or functional phrases.

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FROM WATT TO CLAUDIUS: The Rise of Thermodynamics in the Early Industrial Age—D. S. L. Cardwell—Cornell Univ. Press, 1971, 336 p., 26 plates, drawings, \$11.50. Integrates the theoretical and technological aspects of thermodynamics as it traces the history of one of the most important developments in the industrial revolution.

1972 BRITANNICA YEARBOOK OF SCIENCE AND THE FUTURE—Dean H. Schoelkopf, Ed.—Encyclopedia Britannica, 1971, 448 p., illus. in color, photographs, \$12.50. Signed, illustrated feature articles range from colonizing the moon, longevity, test-tube materials, and instant intimacy, to UN science mission, in addition to the year's review of events in the sciences.

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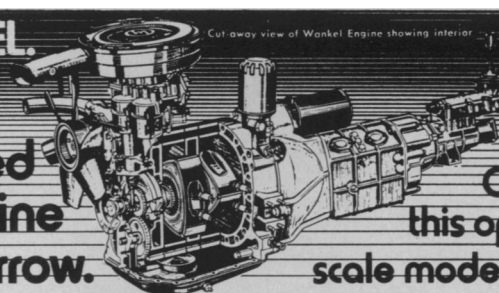
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