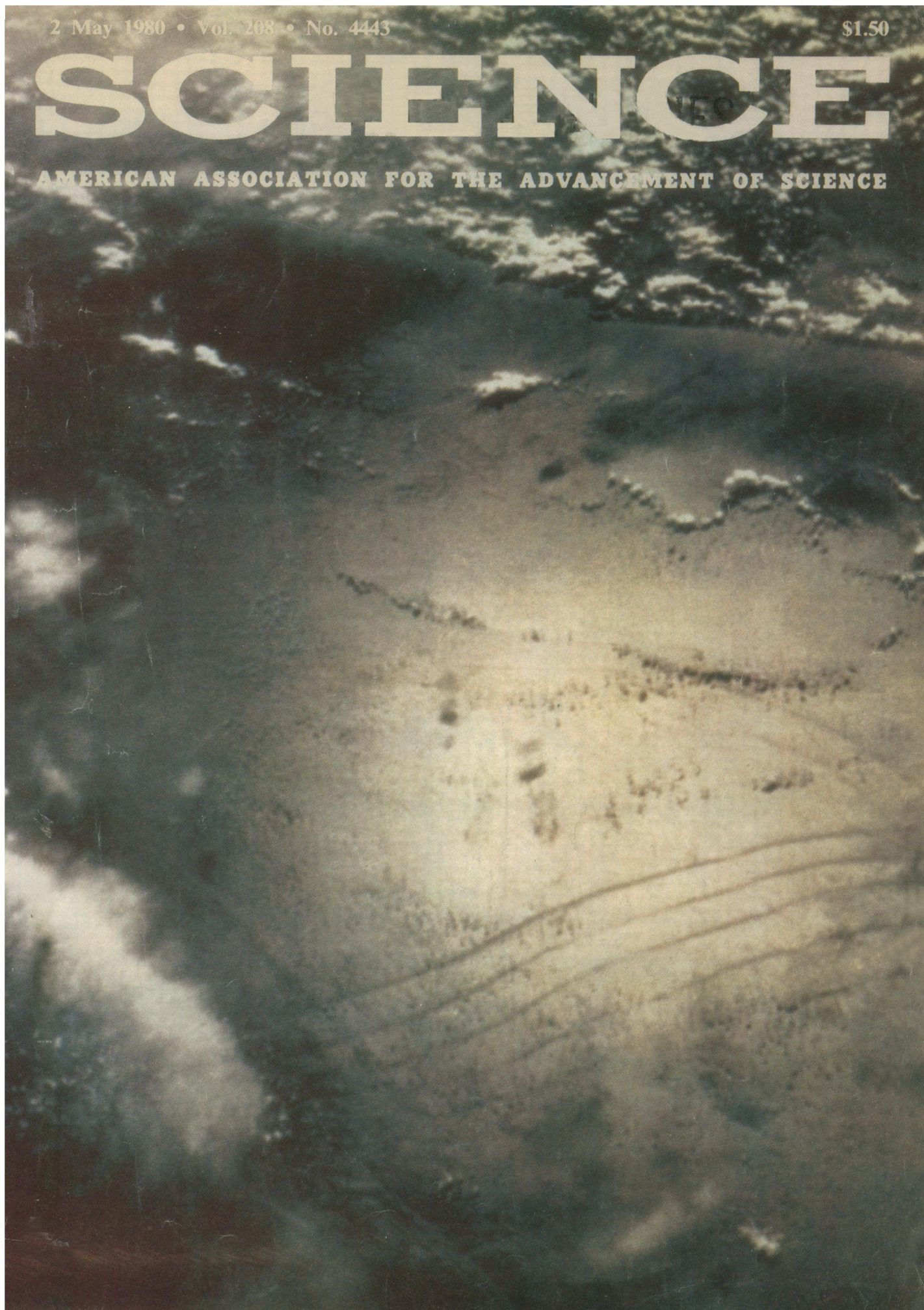


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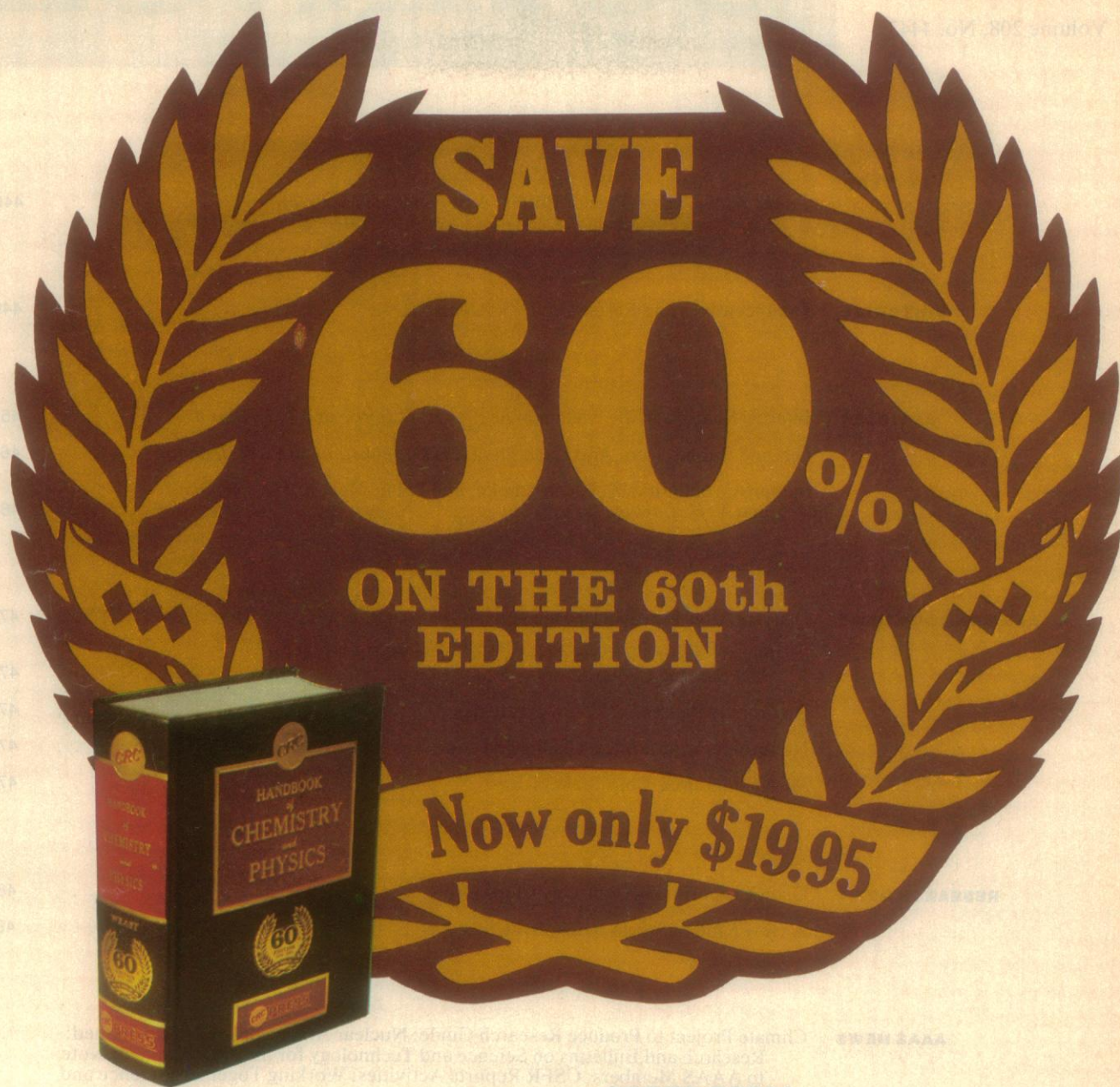
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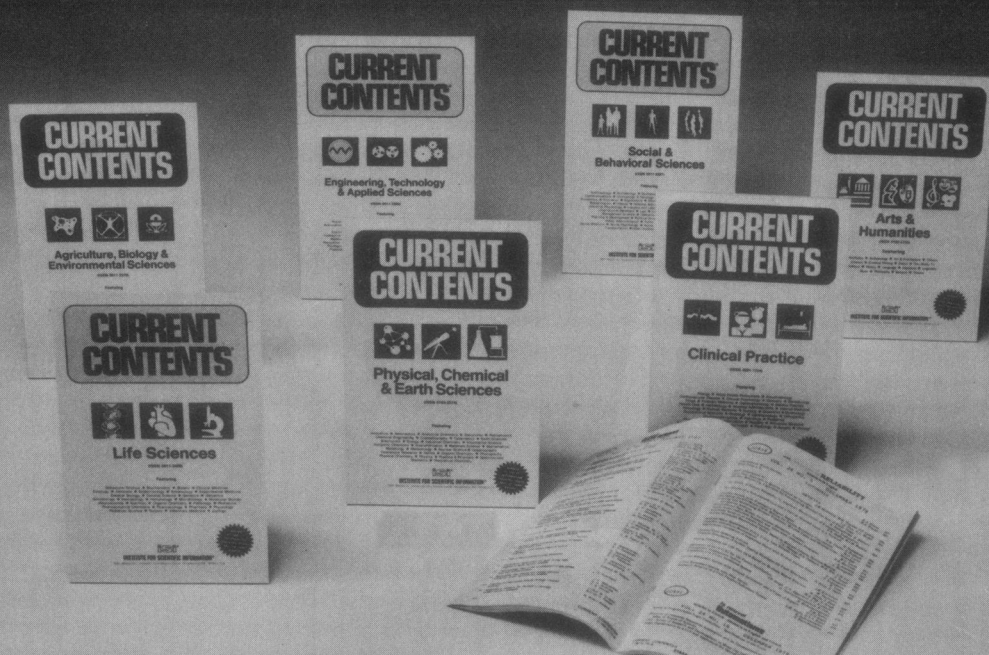
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Apollo-Soyuz photograph of the Andaman Sea (north is to the left). The west coast of Thailand is in the upper part of the picture. The light puffy regions are clouds while the long striations (about 100 kilometers long) in the lower center are caused by the presence of large internal waves propagating toward Thailand. Such striations are visible from orbit because the internal waves modify the reflectivity properties and amplitudes of ocean surface waves. See page 451.

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Tax Incentives and Research

President Carter, on several occasions, has stressed the importance of increasing the level of research and development in the United States. For example, in his Industrial Innovation Message, the President announced specific actions and recommended others requiring legislation. These actions and recommendations related to concerns about lagging productivity, balance of payments, and competitiveness in international trade. He indicated in his message that, in addition to the initiatives already taken, tax incentives to encourage research investments by U.S. industry would be considered at some later date.

On 10 December 1979, Paul A. Samuelson, MIT Professor of Economics and Nobel Laureate, in discussing U.S. economic problems told a joint congressional hearing, "Here is where *cool calculation of cost and benefit point up the vital contribution that support of pure and applied science can make*" (Samuelson's emphasis). As a result of such calculations, it is now generally agreed that there are benefits from R & D's investments that go beyond those capturable by private firms. In fact, returns to society from industrial research generally far exceed the returns to the individual investors. These observations suggest that our nation is underinvesting in R & D. Such underinvestment should be addressed by a combination of both public expenditures and incentives for private investment. Much has been said about public expenditures to support R & D. There has been less discussion about tax incentives for greater private investment.

In R & D, as in other industrial activities, taxes have an important influence. Though business conditions and "entrepreneurial spirit" dominate business decisions, the tax situation plays a role in deciding how much R & D will be done, what kinds of R & D will be done, and whether it will be done in the United States or abroad. There are several tax options that should be considered to encourage research by U.S. companies: accelerated depreciation for R & D construction and equipment; tax credits for increased R & D spending; tax incentives for cooperative industry-university basic research; modifying regulation 861-8 of the Internal Revenue Service, which tends to force U.S. companies to conduct their research overseas.

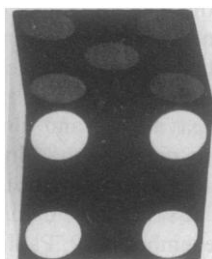
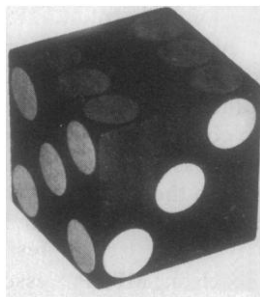
A number of countries use tax policy to encourage R & D. Japan, for example, has made liberal use of tax incentives for some time. The most novel provision is a special tax credit for R & D expenses. A company is allowed a 25 percent tax credit on those R & D expenses that represent an increase over the highest R & D expense incurred in a base period. A 50 percent tax credit is allowed on any portion of R & D expenses that is in excess of a 15 percent annual compound rate of increase over the base period. These benefits are reduced if a company's R & D expenditure fell below the base level in some intermediate year. The special tax credit for increased R & D expenditures is limited to a maximum of 10 percent of a corporation's tax liability.

West Germany has also offered tax incentives for research and development. These include accelerated depreciation for plant and equipment devoted to R & D; a special allowance for corporate support of university and other research groups; and an additional deduction if an investment is related to basic research, new methods or products, or the extension of methods or products of "significant importance."

These examples are not cited to suggest that we should copy the policies of Japan or West Germany, but to emphasize the need to reconsider U.S. tax treatment of R & D. Clearly the time is ripe to analyze various tax options that will foster private investment in research and to decide which are most appropriate within the framework of our broader tax policy.

—RICHARD C. ATKINSON, *Director, National Science Foundation, Washington, D.C. 20550*

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