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# SCIENCE

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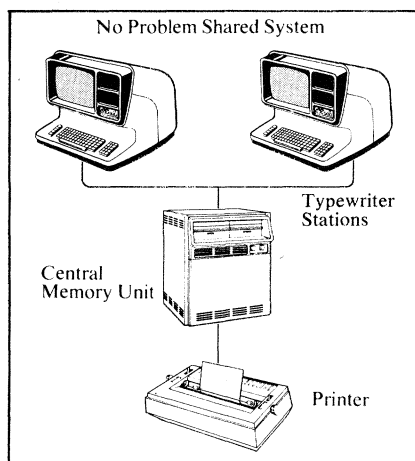


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Foraminifer (*Globigerinoides sicanus* de Stephani) from the middle Miocene at AMCOR site 6004, showing diagenetic dolomite crystals (rhombohedrons) penetrating the calcite foraminiferal test. See page 515. [Cy Wylie Poag and John E. McLane, U.S. Geological Survey, Woods Hole, Massachusetts 02543]

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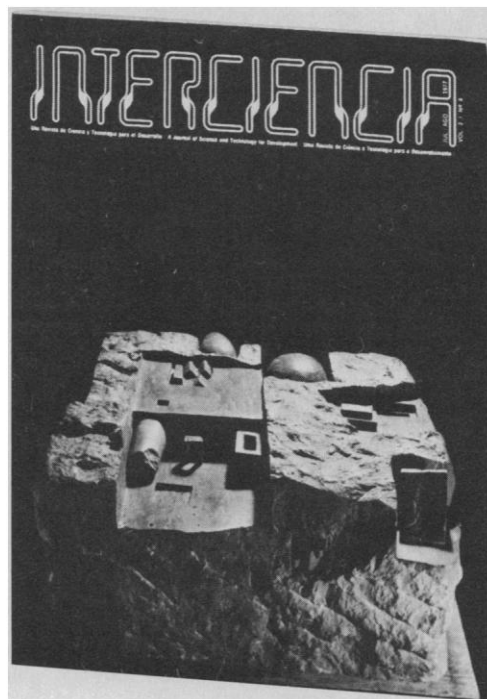
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## Understanding Energy Conservation

Improved efficiency of energy use would reduce growth of energy consumption, save money, lessen adverse environmental effects of energy production, and provide additional time to develop alternative sources. How to obtain these benefits is not entirely clear. We lack sufficient information to decide on the proper roles for private enterprise and governments, or the best mix of government activities among the residential, commercial, industrial, and transportation sectors. Within each sector, we do not know the need for, and value of, government programs that deliver information on energy use choices; regulate efficiency of equipment, buildings, and motor vehicles; provide financial incentives to purchase energy-efficient systems; and fund R & D projects on new technologies.

Consider the residential conservation service (RCS) as an example. The 1978 National Energy Act requires major electric and gas utilities to offer certain services to their residential customers. The act prohibits utilities from providing financing to their customers. Several proposals made this summer (less than 1 year after Congress created the RCS) would require utilities to offer such financing.

Surprisingly, we have almost no evidence to support either a need for or a ban on utility financing. The only relevant data are anecdotal and were not collected to aid RCS decision-making. Preliminary information from the Internal Revenue Service shows that only 11 percent of the individuals filing 1978 tax returns claimed conservation or solar tax credits (for the period April 1977 to December 1978). A 1977 survey of New York homeowners showed that of the respondents who did not plan to add insulation during the next year, only 1 percent said they were unable to obtain financing, and only 3 percent of the low-income respondents cited lack of financing as their reason. These results suggest that lack of financing may not be an important deterrent to residential conservation actions. On the other hand, utility financing activities in Oregon and Washington are apparently quite successful.

We do not know enough about other possible obstacles to residential conservation actions to make intelligent decisions on government programs. For example, we have almost no data on the effectiveness of offering onsite home energy audits (as required by the RCS) relative to the effectiveness of offering computerized audits, which would be much less expensive. This is unfortunate because the RCS is likely to cost the federal and state governments and the utilities about \$2 billion during its 5-year life (not including the household cost of conservation measures).

Better data would help in making crucial choices concerning energy conservation measures. The Energy Information Administration of the Department of Energy (DOE) should devote more effort to the collection of relevant data from individual energy consumers on energy use patterns and the determinants of that energy use (fuel prices, availability of fuels, incomes, government conservation programs, and the like). The DOE should provide technical assistance to state energy offices on the best methods of collection of energy use data. Existing and planned federal conservation programs require states to collect large amounts of data related to energy use and program effectiveness. However, the data are likely to be riddled with errors, largely unused, and organized differently in each state. This will make it difficult to develop national data bases and to use these data to help understand patterns of energy use and their determinants.

Without more attention to the collection and use of energy conservation data, we will continue to make decisions about energy efficiency blindly. Intuition cannot continue to be the primary basis for program development. The importance of our energy problems and the large potential benefits of energy conservation measures require us to do better than that.—ERIC HIRST, *Oak Ridge National Laboratory, Oak Ridge, Tennessee 37803*



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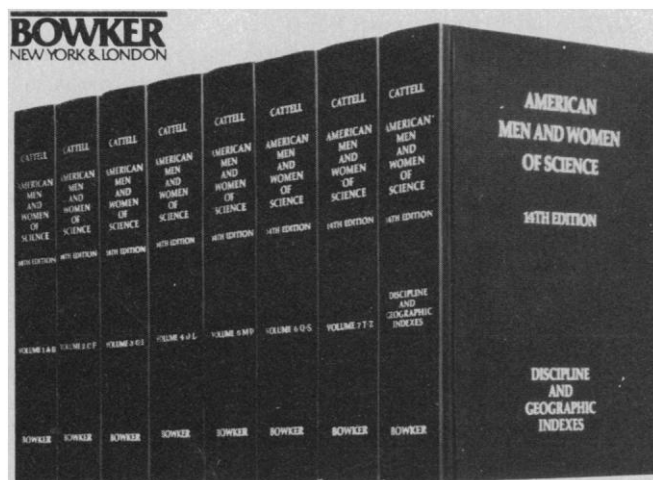
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