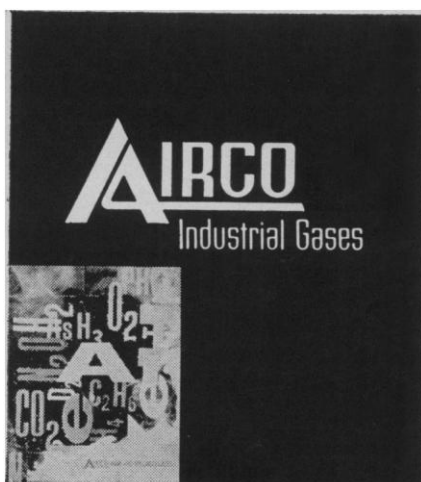




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sure is promising in this regard although the effects thus far studied are rather small. For example, the dT/dP slope of the Curie temperature curve for nickel is 0.35°C per kilobar. Other materials, such as ferrites, may show larger effects.

New developments in shockwave research now permit a derivation of the fusion curve (P versus T) of copper extending into the million-bar range. When combined with accurate measurements of temperature and pressure in the static high-pressure range (1100° to 1300°C and 0 to 60 kilobars) the fusion curves of several substances, such as copper, silver, and others, could be used for *in situ* checking of calibrations of high-pressure, high-temperature apparatus. However, in a broader perspective, accurately determined fusion curves may permit solution of some rather fundamental questions in geophysics and astrophysics involving extrapolation of phase diagrams to very high pressure and high temperature.

The kinetics of shockwave processes are being investigated from several viewpoints. These include lattice dynamic models of shocks in solids and experimental investigation of nonequilibrium processes at relatively low shock strengths in many cases. The behavior of shocks in regions of phase changes are especially interesting. The rate at which such changes occur depends upon the types of lattices involved and the orientation of the lattice with respect to the direction of the shock. From the viewpoint of pressure standards, additional studies of the transformation of iron at about 126 kilobars were reported in the meeting. These confirm this fixed point as being the most accurately determined fixed point above 100 kilobars.

The symposium was sponsored by the National Bureau of Standards and the Geophysical Laboratory of the Carnegie Institution of Washington. Expenses were covered by a grant from the National Science Foundation. The papers presented, together with discussion from the floor and summaries of panel sessions, will be published as a Special Publication of the National Bureau of Standards.

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Oceanology

The American Management Association's briefing session, Oceanology—The Challenge to Industry, was held 24–26 February 1969 in New York City. The meeting was attended by 250 persons and addressed by Vice President Spiro Agnew, Senator Clairborne Pell, Rear Admiral O. D. Waters and many other leaders of industry, commerce, government, and the academe.

Its stated purpose was an attempt to supply answers to certain questions concerning the future of oceanology, such as:

1) How much time, planning, and money will the new Administration be willing to commit to oceanology?

2) What is the most effective way to manage the specialized, technical, and personnel functions of oceanic business?

3) What changes is the status of oceanology can we expect to see in the next 5 to 10 years?

4) What is the immediate and long-range profit outlook?

The sessions of 24 February dealt with the current status and immediate outlook for oceanology.

Senator Pell's keynote address presented a general analysis of the report of the Marine Science Commission report. He conceded that few people would agree with it completely in its present form. However, he advocated the two principal thrusts of the report—the need for the establishment of a new independent agency to spearhead the national oceanographic program and the recommendation for a substantial increase in expenditures for the program in the coming decade.

Pell further noted that ocean programs must be justified by "pay-off" rather than "spin-off." Our ocean programs involve roles of government and industry, and government's role in development of technology ends when its programs have established the feasibility of economic "pay-off."

Further presentations concerning the Marine Sciences report were made by Richard Geyer, Charles Baird, and James Crutchfield. They suggested that the concentration of government agencies and effort into a single, powerful, national oceanographic and atmospheric agency (NOAA)—a kind of "wet NASA"—would materially enhance our effectiveness in dealing with oceanography's complex problems.

Vice President Agnew's invitation had come at a time when he was still

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governor of Maryland. He explored areas of conflicts between states, such as that of Maryland and Virginia in Chesapeake Bay, and the need for conservation as related to the oil spill at Santa Barbara.

Papers were presented by Admiral Waters, oceanographer of the Navy, who expressed the belief that the word "oceanology" would never replace the now too deeply ingrained "oceanography."

J. L. McHugh discussed (by telephone) the role of the Department of Interior and James Gulick, that of the Department of Commerce.

Some general indications, resulting from discussions, are:

1) Offshore leases for small companies are favorable.

2) Offshore mining will be unattractive for some years to come.

3) Desalination has limited opportunities.

4) Marine electronics has great potential.

5) Technical considerations are more important in oceanography than in most other activities.

6) Three basic objectives of ocean law are: (i) to establish and protect the rights of individuals, groups and nations; (ii) to mediate conflicts short of war; and (iii) to promote effective development of the sea.

7) Insurance companies must still feel their way concerning total-loss rates for underwater studies.

8) All types of technical personnel are needed but that Ocean Engineering has the brightest future.

The closing sessions considered aspects of international cooperation and competition in oceanology. Presentations were made by Ambassador Donald L. McKernan (Department of State) and Ritsuro Harano (Japan).

The closing paper by Dr. Paul M. Fye was entitled "A scientist's recommendation for active participation in oceanology." The general tone was one of optimism both for the present and for the International Oceanographic decade of 1970-80. This impression was most succinctly expressed by Vice President Agnew in his quotation of a Welsh proverb that "Three things are untamable: fools, women, and the salt sea." He noted we are on the threshold of taming the sea, but that fools and women may take a little longer.

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