ductivity and distribution of nutrients in the oceans will change. The West Antarctic ice sheet, according to many scientists, is particularly vulnerable to warmer oceans (SN: 10/7/78, p. 246). Should it melt — and estimates give it 50 to 300 years — it could raise sea levels worldwide by five meters, they say. Studying ocean physics is the key to understanding such effects, according to the panel.

Increased CO_2 and warmer temperatures will begin to nudge the limits of plant and animal tolerance, altering competition among species and possibly changing forest succession among plants. Such changes are particularly researchable, said the panel on the "unmanaged biosphere," chaired by Frederick Smith of Harvard University. Salt marshes might be studied, for example, as areas that must adapt rapidly to changing environmental conditions.

The strongest pro-CO_2 signal came from the panel on agriculture and domestic animals. Agriculture, limited primarily by water, stands only to gain from CO_2-increased precipitation. "The bottom line is that we don't see catastrophe in the dislocation of agricultural productivity as a result of an increase in CO_2," Michigan State University's Sylvan Wittwer, chairman of the panel, told SCIENCE NEWS. "There are opportunities here that we need to look at." New strains of crops attuned to such changes could reap maximum benefits from increased CO_2, he said.

The attitude expressed by Wittwer and others has come, Bretherton told SCIENCE NEWS, as other scientists — particularly economists and agriculturalists — have taken a look at the CO_2 issue. "There are specific things — details such as the West Antarctic ice sheet — that need to be looked at," he said. "But the clear disadvantages [of increasing CO_2] are in the 'noise' level. We would have to have a much greater response to stop burning fossil fuels."

So how does this translate into public policy? Very simply, it comes out: Be adaptable. The panel on social and political institutions said the social sciences must find ways to encourage and develop those parts of society and institutions that are attuned to the physical world — "build in the appropriate infrastructures" in social science parlance. Learning to manage CO_2 as a "trend crisis" rather than as an immediate problem, the panel said, can serve as a model for managing other long-term issues.

According to the economics impact panel, adaptability means making "decentralized decisions" based on understanding of details. Investing in real estate, for instance, will require attention to the possibility of rising sea levels. No drastic policy changes are required, said economist Lester Lave of Carnegie-Mellon University; such awareness should already be a part of decision-making. "If your house is in order," he said, "you're all right." □

Chemists catch the sun (on electrodes)

Sunbathing was not the predominant activity of the 8,000 chemists who gathered in Honolulu last week to hear probably the largest number of talks on chemistry ever given at a meeting. Outside the technical sessions, one major activity was socializing with chemists from other countries; the meeting was co-sponsored by American and Japanese chemical societies and attended by scientists from 42 countries including the People's Republic of China. The other dominant pastime was standing in line at the airline agencies. The strike of United Airlines mechanics prevented some U.S. chemists from reaching Hawaii and kept those who did arrive busy trying to make alternative return reservations.

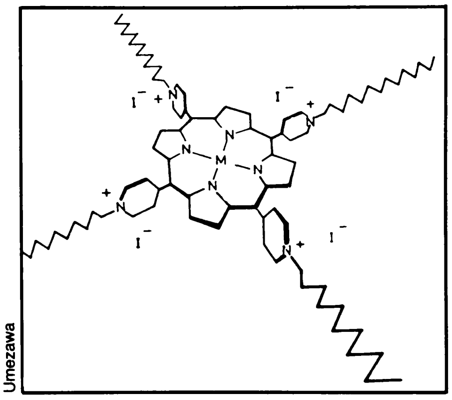
Still, the sun permeated a number of the scientific sessions, exciting the researchers with possibilities for using chemistry, as plants do, to convert solar energy into other forms. Diverse and ingenious schemes are already being applied to harnessing sunlight (SN: 4/22/78, p. 248), but the chemists at this meeting described new angles on materials for generating electricity and for splitting water into oxygen and hydrogen, which can be stored or used as fuel.

An oxide of a rare earth, rhodate, is the key to a system powered solely by light that both produces hydrogen from water and generates electricity. H. S. Jarrett and Arthur W. Sleight of E. I. Dupont de Nemours and Co. report that the red oxide absorbs sunlight better than do white semiconductor oxides, and the new cathode does not decompose as the system is used. "If we take the system out into sunlight, we see hydrogen and oxygen bubbling off the electrodes," Jarrett told the press. "There is enough energy left over that some electrical power can be generated." The researchers now hope to find a less expensive, but suitable, cathode and to develop a more efficient system.

Another approach to making solar cells is to coat an electrode surface with light-absorbing molecules. Kenichi Honda of the University of Tokyo is using chlorophyll as a coating, but others synthesize new compounds to make an especially stable cover. Yoshio Umezawa and colleagues, also at the University of Tokyo, have worked with porphyrin molecules. They report synthesis of a compound, that Umezawa says gives nearly permanently stable coated platinum electrodes. The synthetic porphyrin has long side chains that attach to the electrode, "like an octopus," Umezawa says.

Finally, Shigeo Tazuke of the Tokyo Institute of Technology describes a chemical system in solution, rather than with electrodes, that more directly mimics a green plant. It uses sunlight to transfer electrons from water to carbon dioxide, generating a more complex organic compound. Tazuke simplifies the plant's intermediate electron transport steps into three components. Light is absorbed by an aromatic hydrocarbon, which transfers electrons from amines to aromatic cyano compounds. In the presence of water and carbon dioxide, formic acid and hydrogen peroxide are produced. Tazuke says the efficiency of the system now must be increased by separating the products to prevent their decomposition. He plans to develop an electron transport membrane, thus further imitating photosynthesis in green plants. □

Umezawa



New porphyrin stably coats electrodes.

Cooking with gas: More NO_x concern

A cozy kitchen with a teapot whistling on a gas stove joins automobiles and factories as a source of nitrogen oxide pollutants. High concentrations of nitrogen dioxide, which have resulted from occupational accidents, can cause lung disease and even death. Recent concern over less obvious effects of long-term, low-level nitrogen oxide exposures has led to comparisons of large groups of people living in different communities and to studies tracing the fate of the nitrogen oxides within experimental animals.

Gas cooking versus electric cooking was one of the questions asked as part of a long-range study of children and adults in six U.S. communities. Frank E. Speizer of Harvard Medical School reported a preliminary result at the Honolulu meeting of the American Chemical Society. The nitrogen dioxide measured inside the houses was higher when cooking was done with gas, rather than electric, stoves. Speizer and colleagues tested approximately 8,000 children, ages 6 to 9, half of whom were from homes with gas stoves.

Across the communities, the children whose parents cooked with gas had lung functions slightly, but consistently, below those of the children from homes with electric stoves. Analysis of medical information provided by the parents revealed that children from gas-stove homes had 15