

and touching. When the mother appears voiceless and immobile as in Carpenter's first two experiments, the situation does not conform to the infant's everyday experience. For when Carpenter placed before each baby the mother alone, mother's face plus mother's voice, mother's face with a stranger's voice and vice versa, the voiceless mothers received more attention than either strangers or the mother with a stranger's voice.

"Clearly this selected group of infants were capable of detecting differences between the two live female faces during the earliest weeks of life," Carpenter

says. "Whatever cues the infants were using—salient features or the whole configuration—they were sufficient to allow discrimination in the first fixation. . . . Further, it appears that more than one category may be used in classifying information. It may also be that infants do not have to build up their picture of the world from scratch, but see configurations which become elaborated and refined in the course of development. More sophisticated information processing capabilities appear to be operating in the newborn's interaction with its environment than we had thought possible." □

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## Energy: The long and the short of it

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The preliminary report of the long-awaited Energy Policy Project of the Ford Foundation has now been issued. The study, produced under the direction of former Presidential energy advisor S. David Freeman, contends the United States has considerable flexibility in choosing long-range energy sources and in making trade-offs between development and environmental protection. But it is not so optimistic over the possibility of finding solutions to immediate energy problems that would not harm the environment or cause undue hardship to some segments of the population.

The report examines several of the most often cited options for meeting the current crisis and finds each wanting. Coal, for example, may not become the stop-gap fuel of the immediate future because of long-standing labor grievances, a shortage of mining supplies, a shortage of boilers designed to use coal instead of oil and concern about environmental hazards. A new underground coal mine takes from three to five years to open, and the draglines that provide the most efficient way to strip-mine take two or three years to manufacture and erect. The United Mine Workers industry-wide contract expires later this year, and miners are expected to demand sweeping new provisions for improved working conditions, which for decades have been less safe than in most European countries, according to the report.

While conservation of energy may be laudable, the report concludes that

until more energy-efficient buildings and equipment can be built over a period of years, conservation will have limited effect. Gas-guzzling large automobiles take time to replace, and a new generation of energy-saving office buildings will require years to build. Gloomily the report concludes: "It appears that shortages are here to stay for the next few years."

Over a longer period of time, however, the report says the United States has a wide range of choices among energy-saving and energy-generating plans, each providing an increasingly beneficial standard of living. To continue the present energy growth rate of 3.4 percent a year would require "very aggressive" development of all major domestic energy resources. But citizens could enjoy more goods and services even if energy growth were brought down to zero by 1985, through increased efficiencies of machines and industrial processes and careful coordination of energy resource exploitation.

For the short term, the report recommends Government action to control prices and allocate shortages, to prevent equity dislocation and undue hardship on poor people. For the long term, more research and development will be needed, together with governmental coordination of planning and data. The report issues a special plea for help to underdeveloped countries which have received "a far more savage economic blow" than the United States. □

complexes has now been identified at the University of Washington. Each immunoglobulin molecule in a rheumatoid complex (or factor) serves both as antibody and antigen, resulting in a self-associating system. In other words, the molecules in a complex have an incestuous preference for each other rather than for the usual foreign chemical enemies (antigens). The Seattle researchers, Richard M. Pope, David C. Teller and Mart Mannik, report their findings in the latest (February) PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES.

Some investigators believe rheumatoid inflammation is caused by rheumatoid factors (SN: 9/16/72, p. 182). Pope says his group's findings do not provide additional evidence that this is so. But the findings might explain the continuing process of rheumatoid arthritis. "Once it [the complex] gets started," he says, "the fact that it reacts with itself sort of messes up the feedback system. It is possible that this could cause the production of molecules to continue even without another stimulus." □

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## A hypermagnetic white dwarf star

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For some time now several astronomers have been examining the spectra of white dwarf stars looking for circular polarization that would be evidence of magnetic fields. Only a very few have been found. Now, from Battelle Institute's Pacific Northwest Laboratories, comes a report of a supermagnetic white dwarf, which is also the first magnetic white dwarf to show evidence of rotation.

The star is GD 229 in the constellation Cygnus. The observation was made by John B. Swedlund and Joseph Michalsky. Its magnetic field is 10 million times as strong as the earth's, and shows rapid variations that indicate, Swedlund says, rotation of the star.

One reason for looking for such objects is to give support to hypotheses about pulsars and X-ray stars. White dwarfs are one kind of collapsed end product of stellar evolution; pulsars and X-ray sources are believed to be other alternatives for the last phase of a star's life. Hypotheses about how pulsars and X-ray stars produce their signals would require them to be rotating and highly magnetic. Finding such a condition in a white dwarf helps astronomers believe in the possibility of such characteristics in the other possible results of stellar collapse. The work was done at Battelle's observatory on Rattlesnake Mountain. □

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## Rheumatoid factors: Self-immunity

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More than five million Americans have rheumatoid arthritis, a chronically painful and potentially crippling inflammation of the joints. But what this inflammation is due to, scientists aren't sure. However, complexes of antibodies known as immunoglobulin G have

been found in the blood and joint fluids of 70 percent of rheumatoid arthritis patients. So investigators are naturally eager to learn what role they might play in rheumatoid inflammation.

The previously elusive nature of the