Center in Durham, N.C., are using the two-dimensional imaging capability of their ultra-sound scanner. "The hope there is that we'll eventually be able to tell how much gas is released into the blood after decompression by knowing the size and total number of the bubbles per unit time," says von Ramm. The researchers then will be able to correlate the amount of gas released with onset and duration of decompression sickness. In terms of its diving application, however, the real value of the scanner lies not in predicting cases of decompression sickness, but rather in researching bubble behavior, Vann says.

Prior to its recent application to the field of diving, the ultrasound scanner was used mainly for detecting various cardiac problems, such as defective valve operation. The scanner is similar to a radar in that it sends out a burst of sound energy and receives the reflections, or echoes. These sound wave echoes are converted into electrical signals, which in turn are processed and displayed on a screen. Says Vann, the view of natural processes on that screen "is a very effective presentation." □

Legal pot

You may not be able to pick it up at your local drugstore, but the government announced plans last week for distribution of tetrahydrocannabinol (THC), the active ingredient in marijuana that in some cases has proved effective in mitigating the nausea and vomiting of cancer patients undergoing chemotherapy. Cancer specialists licensed by the National Cancer Institute and the Drug Enforcement Agency will soon be able to write prescriptions for THC.

But the controversy behind the drug remains. The Food and Drug Administration's nine-member oncologic advisory board mustered only a one-vote margin last June in recommending release of the drug. Other researchers claim THC's occasional psychogenic side effects should rule it out as a therapy.

On the other end of the scale, some NCI researchers, cancer sufferers and marijuana lobbying organizations believe that marijuana smoked in cigarettes is far more effective in controlling chemotherapy's side effects than is the oral THC being released by the government.

A group of NCI researchers reported in last December's ANNALS OF INTERNAL MEDICINE that while smoked or swallowed synthetic THC prevented vomiting, "smoked THC was more reliable than oral THC in achieving therapeutic blood concentrations." Oral administration, they noted, was associated with variable absorption from the gastrointestinal tract. Alice O'Leary, director of the Alliance for Cannabis Therapeutics, says New Mexico researchers are reporting a 90 percent success rate for marijuana cigarettes, and 60 percent for oral THC. □

Let them eat fungus

Calling its new product "the nylon of the food trade," a British manufacturer is trying to put a fungus on the supper menu. Ranks Hovis McDougall received qualified approval from the United Kingdom Ministry of Agriculture, Fisheries and Food to market for human consumption processed mycelia (filaments) of the fungus *Fusarium graminearum*. Several microorganisms already are grown and processed as supplements to animal feed, but none are offered for human consumption.

The processed fungal mycelia are themselves unpalatable, colorless and tasteless, but with added flavor and color they can be made into passable imitations of fish, chicken, veal and ham, according to the Sept. 4 NATURE. The company began work on the fungus with the thought of selling it to developing countries, but since has shifted its goal to the convenience-food market at home. To make mycoprotein inexpensive enough to attract customers, J. Edelman of RHM estimates the company would need to produce and sell 10,000 tons each year. That is 0.25 percent of current British meat consumption. At present, a pilot plant in High Wycombe, Buckinghamshire, is producing 100 tons of the mycoprotein annually.

Mycoprotein has been fed to laboratory animals for several generations with no ill effects reported. Small-scale, short-term human tests of the mycoprotein have been carried out at the Massachusetts Institute of Technology and RHM has performed some larger trials. The only problem was one case of allergy. The fungal product also looks good nutritionally; it contains 45 percent protein and only 10 to 15 percent fat and cholesterol.

The recipe for mycoprotein is to grow the fungal strain, which has lost the ability to cause disease in plants, in glucose-syrup and ammonia in 1,300-liter tanks at 30°C. Then RHM heats the mycelia to 64°C, inactivates the enzymes that break down protein but still allows other fungal enzymes to degrade nucleic acids into products that are washed from the cells. The heat treatment also changes the texture of the mycelia to make it more like that of meat fiber.

The Ministry of Agriculture, Fisheries and Food has asked RHM to do further animal experiments to determine the effects of mycoprotein on the body's mineral balance because mycoprotein lacks the iron and zinc found in meat, but the high fiber content (20 to 25 percent) could lead to retention of minerals from other foods. Limited-scale marketing should reveal if the public has a taste for it. □

Pain differences, similarities found

Despite the millions of people in the United States who suffer from chronic pain and the 300 or so clinics set up to treat them, very little is known about the sociology of pain — whether groups of people react to or sense pain differently. New research presented at the recent meeting of the American Pain Society in New York indicates that patients' and physicians' attitudes toward chronic pain differ relative to ethnic group and sex.

James A. Lipton and J.J. Marbach of the Columbia University Dental School reported on their study of the relationship between ethnicity and the response to pain. They analyzed the responses of 166 patients suffering from facial pain of unknown origin to 41 agree/disagree statements on pain. The patients were identified as Hispanic, Black Italian, Irish, Jewish, other white Catholic, or other white Protestant.

The researchers found conformity in emotional responses, such as whether the pain evoked tears or moans, but they found definite differences in how different ethnic groups viewed their pain. Hispanics and Blacks were five to seven times more likely to fear their pain was cancer-related than were Italians, Jews and other white Protestants. Irish respondents were less likely to feel they had brought the pain on themselves than were Italians, other white Catholics and Blacks. Other white Catholics were more likely to believe that the pain was imagined than were the other ethnic groups questioned. Hispanics were less likely to admit losing control when they described their pain than were Italians, Blacks, other white Protestants and Jews.

The researchers also found differences in how the patients described their pain. Other white Catholics were more likely to describe their pain as stabbing than were Italian, Irish and Jewish respondents. Blacks were more likely to call their pain unbearable than were Hispanics.

The findings, Lipton says, echo a late 1940s study of pain reactions in first and second generation Americans. "We didn't expect the findings we came up with," Lipton says. "Our population was mostly third or more generation. We thought they'd be more in conformity with each other."

Roughly eighty percent of the 166 sequential visitors to the facial pain clinic were women. Dorothea Lack, a clinical psychologist and pain clinic director in Binghamton, N.Y., produced evidence at the meeting that many women with complaints of chronic pain are subjected to sex-role stereotyping by the medical profession, and end up searching wider and longer for proper medical care.

In a comparison of the previous medical histories of men and women before they visited her pain clinic, Lack found that

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women had their pain longer before being referred, and their treatment had differed from that of men with similar complaints. "They had received more prescriptions for minor tranquilizers, antidepressants and analgesics and fewer prescriptions for narcotics," Lack noted. They had also received fewer pain-related surgical procedures.

But the difference is not that women are more sensitive to pain. Paula Goolkasian of the University of North Carolina studied the responses of women, men and women on oral contraceptives to heat applied to the forearm. When the volunteers rated the pain, Goolkasian found the responses of women on oral contraceptives, men, and women in the non-ovulatory stage of their menstrual cycle to be identical. During ovulation, women not on the pill rated the stimuli more painful.

Goolkasian's study agrees with previous studies that indicate a short period of higher sensitivity to pain during ovulation, rather than a pain threshold change. □

Artificial blood trials

Since 1979 an artificial blood called Fluosol has helped save the lives of about 200 patients in Japan and the United States who could not receive transfusions of natural blood for various reasons. Fluosol is still experimental, however, so those patients in the United States who have received it have gotten it under a special emergency proviso of the U.S. Food and Drug Administration on a case-by-case basis. Thus, the ultimate goal of Fluosol's manufacturers — the Green Cross Co. in Osaka, Japan, and its subsidiary Alpha Therapeutic Corp. in Pasadena, Calif. — is to get Fluosol officially approved by the FDA for clinical use (SN: 4/12/80, p. 237).

Before such approval can be obtained, however, clinical trials demonstrating Fluosol's safety and effectiveness must be conducted at U.S. medical centers. The FDA has now given the green light for such trials. □

Vaginitis culprits nabbed

Nonspecific vaginitis, a condition marked by vaginal itchiness and excessive vaginal discharge, earned its "nonspecific" appellation by eluding researchers in search of its cause. For years, a bacterium called *Gardnerella vaginalis* has been suspected. Researchers from the University of Washington in Seattle report in the Sept. 11 NEW ENGLAND JOURNAL OF MEDICINE that both *G. vaginalis* and a second class of bacteria are found in women with vaginitis. They did not determine the exact roles of the two bacterial strains, but they did note that a ratio between products of the two types of bacteria is useful in diagnosing the condition and can be used to indicate drug therapy effectiveness. □

Atmospheric science for the 1980s

"[A]s world population increases and our societies become more technologically complex, a critical stage has been reached in our relationship with the earth's atmospheric environment," says the Committee on Atmospheric Sciences of the National Research Council. At the same time, the development of a variety of remote sensors and analytical instruments and the use of computers now enable scientists to "study the atmosphere on all important space and time scales." Hence, says the committee in its recent report, "The Atmospheric Sciences: National Objectives for the 1980s," atmospheric science is on the brink of making significant contributions to "urgent national problems."

Among those national concerns, according to the report, are the increasing effect of human activities on atmospheric quality and climate, the dependence of agriculture, transportation and industry on what is considered "normal" climate and the economic impact on those systems created by "abnormal" conditions such as drought and severe winters. To answer these concerns, the committee, led by Cecil E. Leith Jr. of the National Center for Atmospheric Research in Boulder, Colo., proposes three broad goals for the atmospheric sciences in the next decade:

- improvement of weather prediction capabilities, with an emphasis on precipitation in cyclonic storms (tornadoes, hurricanes) and on severe storms processes;
- understanding of the climate system and how it varies over periods of seasons to decades; and
- understanding of the cycles and reactions of chemicals in the atmosphere and their relationships to atmospheric processes.

In order to attain these goals, says the committee, several specific research problems should receive the highest possible priority by the atmospheric science community and by decision makers. For example, the increased number of weather observations and the improved methods of communicating and analyzing such observations should be used in a focused, coordinated program to improve short-term (one- to three-day) weather forecasts. In addition, theoretical and modeling studies as well as field experiments that use very fine-scale observing networks should aim toward improving predictions of the amounts of precipitation and the timing and duration of storms.

In the area of climate prediction, the committee recommends that researchers use computer modeling to identify short-term, potentially predictable components of climate, such as drought or severe winters, and to find their precursors, such as changes in sea surface temperatures. Modeling studies should also be used to determine the climatic effects of alteration of the earth's surface by natural (snow cover, deserts) and human (deforestation, urban development) activities.

The third topic of concern, atmospheric chemistry, is one of the least understood areas of atmospheric research, the committee points out. Research programs should be designed to study how various atmospheric chemicals affect the response of the atmosphere to solar radiation, such as the "greenhouse" effect of carbon dioxide. More specifically, atmospheric chemists in the 1980s should identify the factors contributing to acid rain, decreased visibility and regional air quality, as well as determine how pollutants are transported and altered. □

Monsters of the sky

What's 11 feet long, 6 feet tall, weighs 170 pounds and flies? Answer: *Argentavis magnificens*, the magnificent bird of Argentina, which had a wingspan of 25 feet. Recently unearthed fossil evidence (wing, leg and skull bones) suggests that this extinct bird is a previously unknown genus and species of the family Teratornis (monster birds), which includes New World Vultures, such as the condor. Markings on the wing bones of the giant teratorn suggest that it was capable of flight and, if so, it is the world's largest known flying bird. "It's definitely a most spectacular creature," says Kenneth E. Campbell of the Natural History Museum of Los Angeles. While in South America on a National Geographic Society expedition he was invited to study the 5- to-8-million-year-old fossils by their discoverers, Eduardo P. Tonni and Rosendo Pascual of Argentina's La Plata Museum. □

