

Origin in space

For over a century, scientists have debated the origin of organic compounds discovered in the class of meteorites known as carbonaceous chondrites. Last December, a group led by Dr. Cyril Ponnampertuma of the National Aeronautics and Space Administration's Ames Research Center reported strong evidence that amino acids discovered in the meteorite that landed Sept. 28, 1969, near Murchison, Australia, were of extraterrestrial, non-biological origin (SN: 12/5/70, p. 429).

In the March 12 NATURE, five scientists from the University of Houston report the results of their own analyses of samples of the Murchison meteorite. Though they are more tentative in their conclusions, the Houston scientists generally confirm the findings of the NASA researchers.

Drs. Juan Oro, Harris Lichtenstein and Don A. Flory and Josep Gilbert, and Sten Wikstrom analyzed the organic compounds of the Murchison meteorite by a combination of gas chromatography and mass spectrometry. They obtained their samples from 2 centimeters beneath the surface of a large piece of the meteorite almost entirely covered with fusion crust and with no visible fractures.

The researchers report that they found preliminary mass spectrometric evidence for the presence of the amino acids glycine, alanine, 2-methylalanine, amino-butyric acid, valine, glutamic acid, proline, sarcosine and some leucines. The principal amino acid observed was glycine. An appreciable number of other amino acids are yet to be identified, the researchers say.

Like the Ames researchers, the Houston scientists found the amino acids to consist of about equal parts of right-handed and left-handed molecular structures. Amino acids found in terrestrial living organisms are almost exclusively of the left-handed configuration. In fossils, the proportion of the two configurations seems to equalize with time, but it takes about 100,000 years. Therefore, amino acids of equal proportions of the two configurations in a meteorite that fell less than a year and a half ago must, so the argument goes, either have originated extraterrestrially or be the result of contamination by very old biogenic amino acids after the meteorite reached the earth.

There are four ways the amino acids could have been formed chemically, the researchers conclude: 1. extraterrestrial nonbiological synthesis; 2. extensive diagenesis or rearrangement of the meteorite's components; 3. formation during the entry of the meteorite

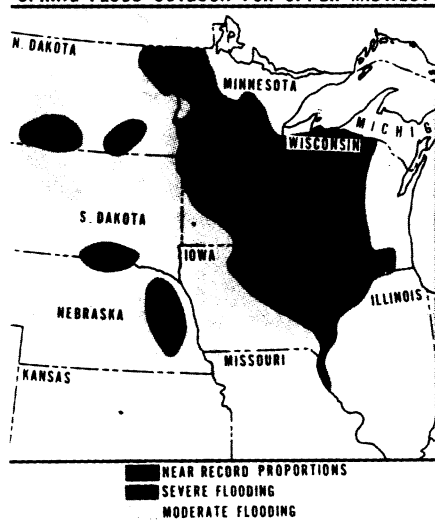
through the earth's atmosphere; and 4. chemical synthesis during the experiment. Although the last possibility cannot yet be ruled out, the researchers admit, "the first mode of synthesis seems the most likely."

Another piece of the meteorite was analyzed for hydrocarbons. The results, the scientists report, indicate the presence of certain aromatic hydrocarbons similar to those obtained in experiments of hydrocarbon synthesis. □

A PREDICTION

Near-record floods

SPRING FLOOD OUTLOOK FOR UPPER MIDWEST



Inhabitants of North Central river basins have come to accept as a fact of life the floods that come with the spring thaw, when the accumulated snow farther north melts.

This year, the National Weather Service predicts, the floods will be of near-record proportions. Director George P. Cressman warned last week that flooding now seems certain. "This is one of those times we can be sure some rivers will overflow their banks," he said. "The question now is how many and how much. If the season from here out is normal, spring thaws in late March and in April will produce severe or near-record flooding in portions of Minnesota, northeastern Iowa, Wisconsin and northwestern Illinois."

The cause for these floods, Weather Service hydrologists say, is an unusual accumulation of snow. And one reason for this accumulation, explains Joseph Strub of the Weather Service Forecast office in Minneapolis, is excessive concentration of the winter's precipitation in the early fall. The total for October and November was 8 to 12 inches. The normal is about three inches. Early fall precipitation produces soil moisture that freezes to form a frost cap. This frost cap prevents subsequent precipitation from seeping into the soil and

thus increases accumulation. In addition, says Strub, precipitation for the entire winter was above normal.

The crest of this year's flood will come sooner than usual, says Strub—as early as the first week in April for St. Paul—because snow accumulation in Iowa and southern Wisconsin is less than normal. When warm spring weather comes up from the south, therefore, it will travel faster through these areas and hit the northern snow-pack sooner.

The only thing that could lessen the flood, Dr. Cressman says, would be a long dry spell or abnormally slow or intermittent thawing.

The National Weather Service's Office of Hydrology has been making flood predictions for almost 25 years. But up until 1969 the most warning they could give was several days. In 1969, the office computerized its data analysis and was able to give as much as four weeks' warning of that year's disastrous flood.

In the areas that will be affected this spring, Dr. Cressman says, "the outlook is comparable in severity to the record floods of 1969, although those covered much more territory." The 1969 floods extended across 300,000 square miles, caused nine deaths and \$151 million in property damage. The area threatened this year is about 175,000 square miles, and the areas of maximum severity are different. Wisconsin, which was only moderately hit in 1969, will suffer nearly record flooding this year, the hydrologists predict. □

DOMESTIC SATELLITES

Battle shapes up

The question of ownership and operation of a domestic communications satellite system network is one of the hottest issues facing the Federal Communications Commission, and it appears that a heated battle is forthcoming for these lucrative rights among eight major companies (SN: 3/6/71, p. 162).

The Fairchild Hiller Corp. and the Western Tele-Communications Inc. proposals on deadline day this week brought to eight the total number of companies vying to build and operate the communications system. Earlier proposals were submitted by Western Union Corp., Hughes Aircraft Co. jointly with General Telephone and Electronics, RCA Global Communications Inc., Communications Satellite Corp. (COMSAT), American Telephone and Telegraph Co. jointly with COMSAT, and MCI Lockheed Satellite Corp.

The exact requirements for the system have yet to be determined. FCC asked for the concrete proposals before establishing criteria. It is generally

considered, however, that the system would basically serve all of the 50 states and Puerto Rico with television, telephone, telegraph, public broadcasting and high-speed data transmission services. Added public interest options of some of the proposals include free educational television, service to cable TV, the health care and medical community and news media, and individual links between company facilities. Questions such as the number of synchronous orbital spaces to be used and the allocation of the satellites' services are among those expected to be resolved at the FCC's public rule proceedings with all interested parties contributing in April and May. Whether the communications system will be awarded to one or several companies is a key question to be determined. The proportion of channels to be used by common carriers or specialized services and the feasibility of using frequencies of 7, 12 and 13 gigahertz in addition to the 4 to 6 gigahertz range are also major issues.

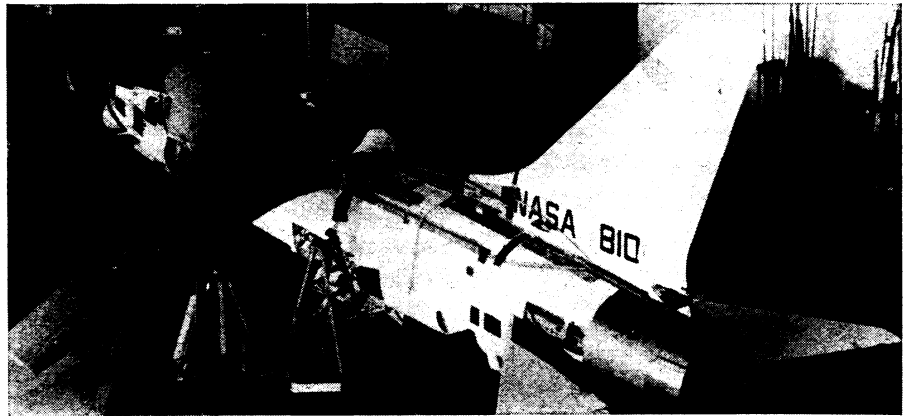
The eight proposals call initially for either one or two operational satellites and one spare satellite in orbit and anywhere from 6 to 132 ground stations of varying capacities. Cost estimates range from \$66 million to \$248 million. Most of the satellites would have 12 or 24 transponders, but the technological capability varies. Lockheed's one operational satellite with a 48-transponder capability would handle simultaneously more than 33,600 business or data circuits, or 48 television channels. On the other hand, Fairchild Hiller's satellite, patterned after the Advanced Technology Satellites the company is building for the National Aeronautics and Space Administration, could handle simultaneously 24 color TV channels and 50,000 duplex telephone circuits, or the 24 TV channels and 3 billion bits per second of high speed digital data. The satellite would carry a 30-foot diameter antenna, the largest proposed. COMSAT's two satellites, proposed earlier this month, could each handle 14,400 telephone circuits or one billion bits or 24 color TV channels.

While each company is competing for the system, they are also competing for the one big financial variable: the three major television networks as users. The networks have an additional two weeks to decide if present proposals are adequate for their needs or if they will submit a system of their own.

Further complicating the picture are proposals to build and operate the earth stations, also due in two weeks. One company, TelePrompTer Corp., submitted its plan this week, however, or five receiver-only stations for its cable TV network system. □

"JUST LIKE A FIGHTER"

Supercritical wing tested



NASA

The supercritical wing on an F-8: Flights test the wind tunnel predictions.

A large portion of the aviation research and development conducted by the National Aeronautics and Space Administration involves the testing of aerodynamic designs and systems for the next generation of transport planes. The advanced transport NASA envisions incorporates many of the theories of Dr. Richard T. Whitcomb of the agency's Langley Research Center at Hampton, Va. (SN: 11/28/70, p. 413).

One such theory is the supercritical wing, designed to increase the over-all efficiency of airplane performance at supersonic speeds. A prototype of the wing, built by North American Rockwell, was successfully flown last week at NASA's Flight Research Center at Edwards, Calif. The new wing was attached to an F-8 jet fighter. In this first flight to test the data acquisition system, the plane reached 350 miles per hour at a peak altitude of 10,000 feet, and "handled extremely well—just like a fighter," says the test pilot, Thomas C. McMurtry.

Unlike conventional aircraft wings, which are curved on the upper surface, the supercritical wing's surface is flattened on the top to slow down the speed of airflow. On conventional models, the air flowing over the surface travels faster than the speed of the aircraft itself and causes local shock waves at supersonic speeds. These increase the drag and result in loss of flight efficiency. The new wing should allow airplanes to cruise at higher speeds—with no increase in fuel consumption.

Tests resumed this week. Eventually the new airfoil will be flown at or above 660 miles per hour at altitudes of 35,000 feet or more.

A thicker version of the same wing, attached to a Navy T2-3 (Buckeye) aircraft, has shown during initial flight tests significant improvement in buffet-free maneuvering capability up to speeds of 0.7 Mach. This design should permit structural weight savings on

any of the moderate-speed aircraft.

Preliminary plans have been drawn up for an agreement between NASA and the Air Force for testing of the wing on an F-111 to verify the potential of increased maneuvering capability at transonic speeds (600 to 900 miles per hour) with variable swept wings. When the agreement is in final form, the Air Force will contract for the wing. □

ALASKA PIPELINE

Trio of doubters

There can be little doubt now that the Nixon Administration is having second thoughts about the proposed Trans-Alaska Pipeline System. First, Russell Train, chairman of the Council on Environmental Quality, expressed reservations. Then Interior Secretary Rogers C. B. Morton mused about possible alternatives at a Senate hearing (SN: 2/27/71, p. 143). This week, William Ruckelshaus, head of the Environmental Protection Agency, completed the roster of the top Administration environmental spokesmen.

In a letter to Morton, Ruckelshaus suggested Interior has not adequately examined the possibility of oil spills from loading facilities at the lower terminus of the pipeline at Valdez and from tankers carrying the oil to the West Coast.

He suggested that Interior consult with EPA on pipeline design, because "tremendous pressure" would be placed on Interior if it were the sole arbiter, and carefully examine alternatives, such as an all-land route for the oil through Canada. Ruckelshaus also called for more study of the effects of the pipeline on the Alaskan permafrost, with special reference to unconsidered alternatives for changing the temperature of the oil, and further development of seismic and leak monitoring systems. □