

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 Ponnamperna 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

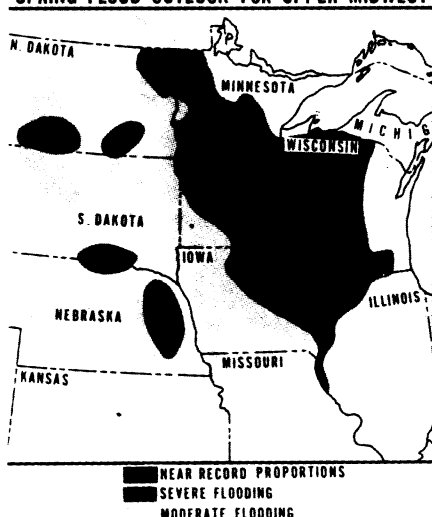
through the earth's atmosphere; and 4. chemical synthesis during the experiment. Although the last possibility cannot yet be ruled out, the researchers admit, "the first mode of synthesis seems the most likely."

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