

Meteorite fall reported in Madagascar

The Malagasy Republic on the island of Madagascar, some 500 kilometers off the coast of Mozambique in south-eastern Africa, is remote from many of the communications channels that spread news of important events around the world. U.S. scientists this week were thus struggling to learn the hard facts behind several reports of a July 30 meteorite impact said to have produced what may be the largest impact crater in modern history, although late conflicting reports were raising doubts.

On that date, according to the French press agency, Agence France Presse, a meteor was seen in the sky over Madagascar's capitol city of Tananarive, accompanied by "noise" and a "bluish light." (U.S. researchers point out that such side effects are typical of large, meteoric fireballs produced by the friction of the earth's atmosphere.) The meteor reportedly broke apart in midair, producing two major fragments that subsequently struck the earth.

The larger fragment, according to both AFP and the Associated Press (which may merely have picked up the AFP account), fell near the city of Fianarantsoa, about 400 kilometers south of Tananarive, creating the 240-meter-diameter crater. The other piece fell in the Ankazobe region, about 100 km northwest of the capital, producing a lesser crater variously suggested to be from 20 to 75 meters across.

On Aug. 2, reports AFP, a team from Tananarive Observatory (which is equipped for seismologic studies) set out "to try and find the point of impact." The earlier reports of the crater sizes and locations would seem to suggest that the impact points were well known, but they may also imply that the observatory team was in fact seeking what could turn out to be yet another fragment. Unfortunately, the observatory was suffering from "a defective machine" (presumably a malfunctioning seismograph) at the time of impact, so that it was only possible to estimate that the recorded impact was somewhere in a radius of about 260 km from Tananarive. The team, however, announced that it planned to begin the search at Moramanga, a town about 150 km east of the capitol, further evidence, perhaps, for a third fragment being involved.

Unconfirmed reports of such a spectacular event are a far from ideal basis for speculation. Nonetheless, says Harold Povenmire, assistant director of the American Meteor Society and director of Bishop Planetarium in Bradenton, Fla., "If the report is true, this would be one of the major, if not *the* major, meteorite events of this century . . . and should provide scientists with valuable information for the next 50 years." By comparison, he says, the major "conventional" fall of this century was the Sikhote-Alin event, which occurred in Siberia in 1947 and

left craters not much wider than about 40 meters. (It was not yet known early this week whether the Madagascar impacts produced the deep craters characteristic of iron-rich meteorites or merely a surface disturbance more like the Tunguska event in Siberia in 1908.)

A single, substantial 240-meter crater, however, would almost certainly rule out the possibility that the impacting objects were pieces of manmade satellites, Povenmire says; the energy involved would have been far too great. Also, the considerable distance between the initially reported sites of the two major impacts seems to indicate that the assumed meteor tangentially grazed the earth's atmosphere, thus producing relatively flat descent trajectories.

Reports by Wednesday, however, were beginning to cast the giant-crater story into doubt, although a meteorite does seem to have fallen in the area. An earthquake may have taken place near Fianarantsoa about half an hour after a small fall (0.3 Richter) to the northeast near Tanatavé. The facts were still unresolved at press time. □

Voyager: Multiplanet mission has message

On Aug. 20 and Sept. 1, a pair of spacecraft will be launched on the latest U.S. interplanetary foray, the Voyager project, bound for Jupiter, Saturn and perhaps Uranus and Neptune (SN: 1/1/77, p. 10). Once past the worlds that are their primary goals, however, the two probes will head out of the solar system, bound on a true "star trek" that will take them far beyond the abilities—and lifetimes—of earthlings to monitor their progress. And just on the chance that there may be someone or something out there to detect their passage, each Voyager craft will carry a message.

It's been tried before. The Pioneer 10 and 11 probes carry plaques with symbolic representations of earthlings, the earth and its location in space. A more elaborate message has been transmitted by the huge Arecibo radio telescope (SN: 11/23/74, p. 325), and the earth-orbiting LAGEOS satellite, expected to stay aloft for millions of years, carries a metal scroll for earthlings of the far future (SN: 4/17/76, p. 248). Yet each is but a whisper in the vastness of space.

The Voyager message is the most elaborate yet, an attempted portrait of an entire planet and its life. Conceived by Cornell astronomer Carl Sagan and a host of friends and colleagues, it consists in part of diverse music (from Bach to Chuck Berry to a Navajo chant), samples of 55 languages, dozens of miscellaneous sounds (whales, rain, a truck, a kiss) and 115 pictures of people, places, artifacts and arts (the sun, DNA, the great

wall of China, an old man with a dog). All are recorded on two copper disks—one for each spacecraft—accompanied by a ceramic playback cartridge and operating instructions. A full description will appear in an upcoming SCIENCE NEWS.

Yet, say the message's authors, the point is not so much that the record may actually be received (in tens or hundreds of millennia), as to get earthlings to consider the real possibility that they may, indeed, not be alone. □

Leukemia fighters in the bloodstream

Leukemia consists of the destruction of healthy blood cells by cancerous blood cells. Thus, one might logically ask whether blood transfusions could correct the problem. Indeed, transfusions have been tried from time to time on leukemia patients, and they have led to some occasional but well-documented cancer remissions.

The blood transfusions do not seem to counter leukemia simply by replacing cancerous cells, though. Bone marrow would still produce cancerous cells to invade the fresh blood. Rather, the fresh, healthy blood seems to contain some antileukemia factor, because selective destruction of cancer cells has been observed in leukemic mice, cats and dogs following infusion of healthy blood, healthy blood plasma (the fluid part of blood) or healthy blood serum (coagulated blood plasma).

What might the antileukemia factor be? Robert L. Kassel, Lloyd J. Old, Noorbibi K. Day and William D. Hardy Jr. of the Memorial Sloan-Kettering Cancer Center have made a good start in finding out. As they report in the PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE (155:230), they have concentrated and purified the factor, and preliminary results suggest that it might be complement proteins. There are some dozen complement proteins, and they comprise one squadron of the body's immune fighters. If the factor is indeed composed of one or more complement proteins, it would strengthen the role of the complement system in fighting cancer cells. Also, now that the antileukemia factor has been purified, it can be tested on leukemia patients to see whether it might help fight their cancer.

First Kassel and his co-workers infused a strain of mice known as AKR mice, which had leukemia, with whole blood, blood serum, heparinized plasma (plasma containing an anticoagulant chemical called heparin) or citrated plasma (plasma containing a solution of potassium or sodium citrate or both). Their results showed that heparinized plasma had the greatest antileukemic activity, serum next and whole blood after that. Citrated plasma did not