

Extraterrestrial amino acids

Last December's report by a group from the National Aeronautics and Space Administration's Ames Research Center of finding indigenous amino acids in the Murchison meteorite (SN: 12/5/70, p. 429) has sparked intense scientific interest. The finding was subsequently confirmed by groups from the University of Houston (SN: 3/20/71, p. 195) and Arizona State University (SN: 3/27/71, p. 210).

The Arizona State scientists, Drs. John R. Cronin and Carleton B. Moore, also reported detecting the same amino acids in an intact piece of a similar meteorite that fell near Murray, Ky., in 1950. Now the leader of the NASA group, Dr. Cyril Ponnampereuma, confirms an abundance of amino acids in the Murray meteorite. Dr. Ponnampereuma told a meeting of the New York Academy of Sciences last week that the group's use of gas chromatography combined with mass spectrometry detected all 18 of the amino acids in Murray that they earlier found in Murchison. They also found the same two pyrimidines—4-hydroxypyrimidine and 4-hydroxymethylpyrimidine—in each meteorite. The

pyrimidines differ slightly from those found in nucleic acids in living cells.

The coincidence to the finds is further strong evidence that the amino acids and pyrimidines were created chemically in space. Although he can only speculate, Dr. Ponnampereuma suggests that the existence of identical complex patterns of amino acids and pyrimidines in two meteorites could mean that this is a basic phase in the chemical process leading to life. The findings increase the likelihood of life elsewhere in the universe.

In both meteorites, six of the amino acids are among those that are commonly linked together to form proteins in living cells; the other 12 are amino acids only occasionally found. They are thus not likely to result from terrestrial contamination. The amino acids are of an almost equal mixture of right- and left-handed molecular structures. Earth organisms produce only left-handed amino acids. The mixture of both types thus appears to rule-out biological origin and is strong evidence for extraterrestrial chemical origin.

Members of the Ames team also included Drs. James Lawless, Keith Kvenvolden, Clair Folsome and Miss Etta Peterson. ASU's Dr. Moore also took part. □

Cyclops: Eye on the universe

For a total of 150 hours from May through July of 1960 the 85-foot antenna at the National Radio Astronomy Observatory in Green Bank, W.Va., monitored radio emissions from the nearby stars Tau Ceti and Epsilon Eridani for any evidence of signals from intelligent extraterrestrial civilizations. The search, Project Ozma, turned up nothing unusual. But it was the first time man had tried to detect signals from any unknown counterparts on other planetary systems.

Last week engineers and scientists gathered at the National Aeronautics and Space Administration's Ames Research Center in Mountain View, Calif., to explore the technological possibilities of a project that would be orders of magnitude more sophisticated than Ozma. The 11-week study, sponsored jointly by Ames and Stanford University, is called Project Cyclops. Its aim is to examine feasibilities and to educate, not to recommend policy. There is no intention of inaugurating such a project at this time. Decades might pass before it is possible. But the study co-directors, Dr. Bernard M. Oliver, vice president for research of the Hewlett-Packard Co. and a

visiting professor at Stanford, and Dr. John Billingham, chief of the biotechnology division at Ames, believe it is not too early for a fuller study of the technology necessary to detect artifact signals.

Basically, Cyclops envisions an interconnected array of 1,000 to 10,000 radio telescope dishes spread over an area perhaps 10 miles across. Such an array should, according to one estimate, be able to detect beamed signals from any civilization within 1,000 light-years. Normal radio "leakage" from the regular transmissions of advanced technological civilizations might be detectable from perhaps 100 light-years. The costs of such an array would have to be justified by the signal search itself, but the array would also be an excellent tool for radio astronomy. One goal of the study is to explore ways in which the dishes could be produced cheaply enough to make the idea feasible. "We would like to nail down the cost of doing this," says Dr. Oliver.

As for the Cyclops array itself, "its mission would be to add a new dimension to cosmology," Dr. Oliver says. "It might establish the science of biological cosmology."

Whatever happened to UFO's?

On May 31 two New Hampshire farmers looked across a field and saw a spherical, flat-bottomed object hovering above the ground. As they watched, the object rose vertically, arced and headed into the wind on a horizontal path.

This is one of several incoming reports of unidentified flying objects received recently by the National Investigations Committee on Aerial Phenomena (NICAP) in Washington. NICAP secretary-treasurer Stuart Nixon says he believes the reports may be the start of a recurrence of saucer sightings or at least the reporting of saucer sightings. NICAP has been a long time waiting. Since 1968 the number of UFO sightings has dropped off, along with public interest in them. Last week a Wall Street Journal article reported that a probable reason for the decline is the negative social climate produced by publication in 1968 of the Condon report, the 810-page scientific study of UFO sightings commissioned by the U.S. Air Force and directed by Dr. Edward U. Condon of the University of Colorado. It concluded that "nothing has come from the study of UFO's in the last 21 years that has added to scientific knowledge." And "that further extensive study of UFO's probably cannot be justified in the expectation that science will be advanced thereby."

This scientific debunking of the UFO phenomena and the subsequent, though not necessarily connected, decline in sightings presents an interesting behavioral pattern. Dr. Ernest R. Hilgard, a Stanford University psychologist who served on the National Academy of Sciences panel that reviewed the Condon report, believes the report itself is not wholly responsible for the falling off of flying saucer interest. "I would like to feel that the report quieted the saucer interest," he says, "but I do not think so." People probably just lost interest, he suggests. "These fads go in cycles," he explains, and many persons who would have been interested in extraterrestrial phenomena have turned to other things: drugs, astrology, Oriental religions and various subjective and philosophic fields. As society becomes more affluent man has time to reflect on his position in the universe. As he does so he attempts to integrate himself into and make himself a more important part of that universe. Belief in other worldly things is one method of doing so, points out Dr. Hilgard. But national and international events of the past few years have tended to make people look inside rather than outside themselves for answers to universal questions. This fad too will pass, says Dr. Hilgard, who predicts

that the UFO's will reappear when it does. At NICAP Nixon says UFO reports usually run in five-year cycles and 1972 should be the start of another cycle.

Dr. Donald I. Warren of the School of Social Work at the University of Michigan in Ann Arbor has another behavior theory on UFO's. In his view UFO's provide a form of escape. "One expression of this escape," he says, "is the possibility of other lives, other planets, other beings like or unlike oneself." UFO's "present the opportunity to escape the system without threatening one's gains in the immediate social environment." Dr. Warren, however, based his conclusions on a person's dissatisfaction with his socioeconomic status. A well-educated person earning a relatively small salary might not be content in his situation and would therefore, suggests Dr. Warren, be a likely person to attach importance to himself

DRUG ACTION ON DNA

Now visible, in 3-D

For some years scientists have zeroed in on drug action at the most intricate cellular level. Although they understand the molecular basis of action for several drugs, it is only now that the three-dimensional structure of a drug has been correlated with its biological action.

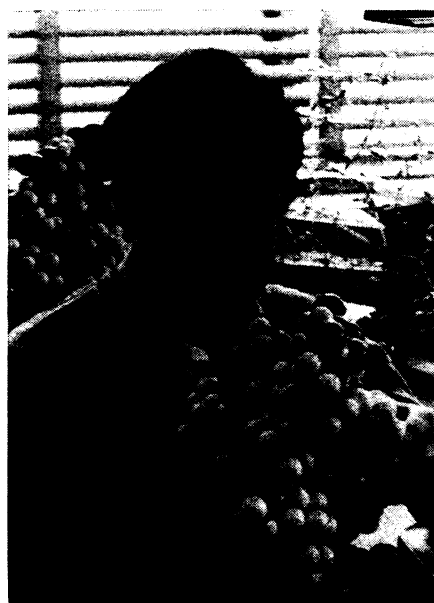
Dr. Henry M. Sobell of the University of Rochester reported last week that by using the technique of X-ray crystallography, he has pinpointed exactly how the antibiotic actinomycin D interacts with DNA. In fact, since the Crick-Watson model for DNA was proposed 18 years ago, this is the first time scientists know visually how anything sticks to DNA.

Dr. Sobell, a physician-turned-crystallographer, says he crystallized actinomycin with deoxyguanosine, one of the four bases of DNA. The three-dimensional structure of the complex immediately suggested how actinomycin binds to DNA. Dr. Sobell believes that the flat portion of the drug molecule fits in between the nucleotide base sequence, GpC, while the protein subunits of the antibiotic make a hydrogen bond with guanine residues on either strand of DNA. Actinomycin has two-fold symmetry relating to the protein subunits. This enables the drug to bind to a base sequence in DNA with two-fold symmetry. This pattern of recognition was first conceived several years ago by Dr. Jacques Monod, who shared the 1965 Nobel Prize with Drs. Francois Jacob and Andre Lwoff for their work in biological regulation. Dr. Sobell's report of the first visual sighting of the drug-gene contact was made in San Francisco at the 62nd annual meeting

by believing in and sighting flying saucers.

This theory may have some credibility, but an article by Dr. Warren in SCIENCE last November advancing these views received a critical response from scientists. The controversy, brought on by a lack of adequate psychological and behavioral information on the subject, points out, as does Dr. Warren, "that this phenomenon has been inadequately studied by the behavioral sciences."

In an attempt to coordinate existing information, NICAP has instituted Project ACCESS (Automated Clearinghouse for Collection and Exchange of Sighting Statistics). All available sighting data (people, places, times, etc.) will be stored in a computer and made available to interested parties. If, these inputs are scientific and objective, as NICAP's Nixon insists they will be, Project ACCESS will be a useful tool for behavioral scientists. □



Univ. of Rochester

Sobell and drug-DNA molecule model.

of the American Society of Biological Chemists.

The medical implications of Dr. Sobell's work may be far-reaching. Actinomycin's repressor-action on DNA, as revealed in the crystal model, might explain why actinomycin works as an antitumor drug. However, the drug is too toxic for lavish clinical control of tumors, precisely because of its stringent action at the molecular level. But now that scientists understand how actinomycin binds to DNA, Dr. Sobell believes they can probably synthesize new antibiotics or drugs that would act on tumor cells or viruses, but not on cells, in the rest of the body. □

SCIENCE NEWSBRIEFS

Nuclear power safety

The Atomic Energy Commission last week announced new, stricter criteria for nuclear power plant safety. Prime emphasis in the new standards is the need for back-up systems in case cooling water systems for reactors fail. Such an accident could conceivably result in overheating of reactor cores, melting of shielding and release of radioactivity. Most affected by the new criteria are five plants licensed before 1968. They will have to install the back-up systems within three years. □

California's AEC ties

The huge University of California system has been heavily involved in defense and weapons research since World War II. Partly in response to student-faculty criticisms (SN: 1/16/71, p. 50) the UC regents last week recommended changes in the contractual arrangement between UC and the Atomic Energy Commission under which the Lawrence Radiation Laboratory is operated. The laboratory consists of two units, the non-secret facility on the hill behind the Berkeley campus and the more closely guarded facility at Livermore. Under the recommendations, the administrative ties between the two units would be severed. And the director of the Berkeley laboratory would report directly to the president of the university rather than, as now, to the chancellor of UC at Berkeley. □

Doctorate oversupply

A new National Science Foundation study on the supply of and demand for doctoral scientists, projected to 1980, indicates an even greater imbalance of supply over demand than in a study done two years ago. Over-all projections show a supply of about 325,000 doctoral scientists in 1980—against an expected demand for about 285,000. The greatest imbalance is in engineering, with a projected 40 percent oversupply. Next greatest is in social sciences, with a 20 percent oversupply. The life sciences situation is somewhat better, with a 9 percent oversupply predicted. Mathematics will see an oversupply of around 10 percent. Only in the physical sciences will supply and demand be essentially in balance. □

Oldest mummy

Possibly the oldest (5,000 years) intact mummy ever found has been unearthed in a tomb in Sakkara, 15 miles southeast of Cairo. The ancient court musician Nofre died in the sixth year of the reign of King Nie Ossen-Ra. The discovery was called historically and scientifically more important than the findings of the Tutankhamen tomb in 1922. □