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T O P S I D E

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DID MARTIANS WIN SPACE RACE?
(Norad News Service, 21 July 62)

While it seems safe to assert that earthmen will conquer space in the 20th Century, a question that could nag him is: did Martians outdo him in the science in the 19th Century?

Dr. Melvin L. Stehsel of Aerojet-General Corporation's Advanced Research Division in Azusa, Calif., points out that astronomers and other scientists have long felt that the network of "canals" observed on Mars could be evidence of an intelligent civilization.

The appearance of one of the planet's moons has caused serious scientific consideration that it may be an artificial Mars satellite launched into orbit from the surface of that planet between 1862 and 1877.

Astronomical observations in 1862, when Mars and Earth were in closest proximity, failed to reveal the "moon". But on the closest view in 1877 ---- suddenly there it was!

Furthermore, it changes its velocity ---- just like our artificial satellites.

North American Air Defence Command's Space Detection and Tracking System is now watching more than 200 objects out in space, but it doesn't have the Mars-orbiting satellite among them. The SPADATS people are concerned with man-made hardware orbiting the planet earth and its potential threat to North America security.

So further details on the Mars satellite will have to be cleared with the Martian space trackers.

IS SOMEBODY OUT THERE?
(Imperial Oil Review, Aug. 62)

by Michael Jacot

There was -- and perhaps still is -- animal and plant life on another planet. Men on earth have examined remnants of that life.

This is not science fiction. It is the contention of an oil scientist and two university colleagues, based on physical evidence they found in the tiny granules of a lump of matter from outer space: a fragment of a meteorite that fell in France 98 years ago.

The scientists -- Dr. Warren Meinschein of Esso Research Engineering, and Drs. Bartholomew Nagy and Douglas Hennessey of Fordham University -- gave the news to a New York Academy of Sciences meeting last year.

Since then there has been further evidence. Because of the tools and techniques used are those of the oil industry in its search for oil-bearing rock, oil scientists have been particularly useful in checking the evidence. An Imperial Oil scientist, Dr. Frank Staplin of Calgary, one of the continent's top paleontologists, has examined the 98-year-old meteorite and confirmed certain of the findings.

It means that other worlds had -- and still may have -- seas on them in which living things could breed. It could mean that "earth man" may no longer consider himself unique.

What Nagy, Hennessey and Keinschein did was analyse organic compounds in the meteorite which fell at Orgueil in 1864. They used such advanced techniques as infra-red and ultra-violet spectroscopy, and high molecular weight mass spectroscopy, all of which are used by oil scientists to determine the composition of organic matter in rocks. They detected hydrocarbons -- which are molecules composed of hydrogen and carbon atoms -- similar to those found in living matter on this earth.

In November last year I interviewed Dr. Keinschein at the Esso Research and Engineering labs at Linden, N.J. Dr. Keinschein is 40, looks a little like the late Humphrey Bogart, has a soft southern accent, keen blue eyes and the precise diction of a trained scientist (B.Sc. Michigan, Ph. D. Texas). He has been engaged in geological research for 10 years. His present main work has to do with the origin of and discovery of oil. He shares a modest office at Esso Research and Engineering with a colleague.

"We believe that wherever this meteorite originated, something lived," he told me.

"What sort of life? Bugs, animals, or something unknown on earth?"

"We don't know specifically what sort of plant or animal life it was."

"Would you find these molecules in terrestrial animals? In me, for instance?"

"Yes. The distribution of these molecules in terrestrial life is very distinctive. Certain molecules are made up mainly of odd numbers of carbon atoms...21...23...25 and so on. The meteorite samples show this characteristic over several tests --- and as far as is known only living things show it."

"Can these particular hydrocarbons be made by anything which was not living?"

Keinschein shook his head. "No. At least there is only one chance in a billion that they can. It would be a sort of fluke."

"Not even in some atmosphere unlike ours?"

"Not that we are aware of."

Keinschein got up from his desk and looked out at the powdering snow on the lawn in front of the labs. "We have always looked at this negatively," he said. "We have assumed there aren't things in outer space, and we have ignored limited evidence to the contrary. Most scientists today --- and many theologians --- feel that the universe wasn't created just for us to look at."

It was this positive attitude which sparked Dr. Nagy's initial investigations of the meteorite. Nagy interested Keinschein, who had gone deeply into the origins of animal matter in rocks while studying about oil, which also contains hydrocarbons. No one is entirely sure how oil is made but we do know that it was formed over millions of years and represents in part the accumulation of hydrocarbons made by once-living things.

Heinschein agreed to take on the meteorite work as a sideline, doing most of it late at night or on Saturdays. Two major questions confronted the scientists. Was the stony material found near Orgueil an actual meteorite? Had it been contaminated by microbes during its 98 years on earth?

Heinschein thoroughly researched these points before they even started analytical work. They learned that dozens of villagers saw the Orgueil stone fall on the clear evening of May 14, 1864. As it hit the earth it exploded, as meteorites usually do. Nearly all the fragments were collected the next morning. They were immediately carefully preserved in casks. It was in one of these samples that the hydrocarbons were found.

Heinschein and his colleagues studied their sample carefully and skeptically. As the research began in earnest they washed the stone, broke it and washed it again. They cleaned all equipment until it was completely free of laboratory contaminants. They used a mass spectrometer at the Pease labs in Linden, N.J. (prototype used in World War II to separate rare uranium U-235 needed for nuclear fission), which can separate infinitesimally small molecular masses which differ only microscopically.

Heinschein, Nagy and Hennessy placed a sample -- less than one thousandth of an ounce -- of the meteorite, supplied by the American Museum of Natural History, in the mass spectrometer.

The first results were disappointing. There was so much water in the meteorite that they could not analyse the hydrocarbons. Heinschein devised a special process for distilling off this water from outer space. It was not like earthly water; it had seven times as much hydrogen in it.

When the extraterrestrial hydrocarbons were next subjected to analysis, the equipment reported them to be similar to those being made on earth by living things. In addition Heinschein and his colleagues found that the inside of the meteorite contained about the same amount of hydrocarbons as the outer layers. This meant that it did not pick up surface foreign matter from museum shelves; otherwise there would have been more on the outside.

The discovery of the organic matter, with its odd carbon count, that Heinschein called "life", thrilled them. They checked and rechecked. Each test came out the same.

Heinschein analysed a sample of another meteorite, which fell near Murray, Kentucky in 1952. Not all meteorites contain carbon compounds, but this one did, and the results were almost identical.

Heinschein is reserved. "These hydrocarbons are certainly traces of other life," he said, "but there is a lot of work to be done yet."

"Is it possible that the meteorites you examined came from this planet? Flew off the earth and then came back onto it?"

"I don't think so. We know of no natural forces on earth that could have placed a stone in orbit. Further more, the metal contents of meteorite differ significantly from those of terrestrial matter."

"Where do meteorites come from?"

"They are thought to have come from the asteroid belt, a ring of space between Mars and Jupiter. In it, chunks of barren rock and metal, some as big as a man's head, others the size of Lake Ontario, travel about endlessly. Some scientists believe that these fragments are from a demolished planet.

"We don't know if they were a part of a former planet. But we are quite certain that the meteorites we have analysed were once part of a biosphere in which one-celled, marine-type plants and animals existed. The Orgueil stone is like a piece of rock from some off-shore bed. Our analyses indicate that the parent body of these meteorites held large bodies of water in which cellular life was able to grow."

"How long ago was this?"

"The age of meteorites is calculated at 4.6 billion years. The life may have come later. If it did not, the biologic remnants are the earliest life that has been discovered."

"Other scientists have worked on the Orgueil meteorite, why haven't they come up with this information?"

"Many scientists have worked on the stone, but earlier scientists didn't have the tools. Incidentally, we are not the first people to say that there is organic matter in meteorites. Berzelius, a Dutchman, speculated about this possibility in 1834. And 24 years later, the German Wohler, stated that certain material (in the Kaba meteorite) was undoubtedly of organic origin. But we can analyse less than one-thousandth of a gram of a substance."

More and More scientists --- although by no means all --- are beginning to agree with Weinschein and his colleagues.

A fourth member joined the team, Dr. George Claus, of New York University. Claus examined other fragments from Orgueil and found fossilized organisms. He examined other meteorites which had fallen in India, Africa and France, and found 25 different organisms all told. Some were single-celled. Others looked like things never seen on earth, with arms and legs coming out of their hexagonal interior.

When Claus completed his examination, Dr. Frank Staplin of Imperial's Calgary laboratories, was asked to take a look. He discovered five or six additional specimens, including what seems to be cell tissue.

He confirmed Dr. Weinschein's discoveries but is not fully convinced that the meteorite came from outer space. Staplin suggests that chondrite meteorites (those with hydrocarbons in them) could have come from the earth, having been flung into space and returned.

Dr. Harold Urey, a leading U.S. physicist, also says that the meteorites may contain a form of ancient life -- in fact the beginnings of life -- which existed on earth, was thrown out onto the moon (where it perished as water dried up there) and has now come back. And Dr. Elso S. Barghoorn, of Harvard University, who has found remains of life in

two-billion-year-old rocks from the earth, also has some reservations concerning the age and original source of the chondrites.

"No carbonaceous meteorite of the type discussed here has been proven to have the average 4.6 billion-year age of other meteorites," says Imperial's Frank Staplin. "We know almost nothing about the earliest history of our planet and about the earliest forms of life. Mathematically, with the fantastic numbers of other suns, it would be extremely unlikely that other solar systems with life do not exist -- but with few fragments of meteorites that we have do not, as yet, support the mathematical suppositions with real evidence."

One thing is sure: we are slowly but surely unravelling one of the great mysteries in the history of mankind.

"STRANGE" OBJECT LIGHTS NIGHT SKY
(Ottawa Journal, 12 Aug. 62)

Did a strange aircraft fly over Ottawa last night, lighting up the sky? This is the question policemen were asked after several of them saw a mysterious flash go from south to north over the city at 12.53.

Police said the flying object lit up the sky momentarily and then disappeared in the north, leaving what looked like "vapor trails."

Several citizens phoned The Journal Office, reporting the same phenomena. One man said the flash seemed to leave a "rocket trail."

Officials at Uplands and Rockcliffe airports reported no record on radar of any aircraft or flying objects, and Dominion Observatory said the flash hadn't been observed there.

Dr. Ian Halliday, acting chief, Stellar Physics Division, Dominion Observatory said a description of the phenomena fits that of a bright meteor.

"A meteor can appear at any time and quite often leaves a luminous train, or vapor trail. It would likely be anywhere between 30 and 50 miles above the earth," he said.

SCIENTISTS STILL EYE MARS LIFE
(Herald Tribune News Service)
(Montreal Gazette, 17 April 62)

by Stuart H. Loory

There probably are high forms of life on Mars, a Colorado botanist believes. In fact, they might be more intelligent than we here on earth. They might be so intelligent that:

In the period between 1862 and 1877 the Martians launched two satellites into orbit around their planet.

Then, having accomplished that feat of space exploration, they stopped further efforts at interplanetary exploration because they were "more diplomatic than us."

All of this, Prof. Frank J. Salisbury, 35, a professor of plant physiology at Colorado State University, is highly theoretical.

In fact, he admitted in an interview, much of it borders on the realm of science fiction.

But the question of life on Mars is a serious enough matter for science, the Journal of the American Association for the Advancement of Science to devote its lead article this week to the topic.

The editors of the magazine commissioned Dr. Salisbury to review the literature and report on the question. The Coloradan cites 36 references from scientists around the world in reaching the conclusion that:

"It might be a little bit premature to eliminate the possibility that intelligent life (human life) exists on Mars," as he put it.

He feels so strongly about this he thinks Earthlings should not land a robot exploration vehicle on the planet until they make better observations via telescopes and fly-by Martian probes.

Dr. Salisbury notes that any life on Mars would have to live under harsh conditions as we know them on Earth. For example, the temperature ranges from 90 below to only 50 above zero Fahrenheit. Atmospheric pressure at the Martian surface is only one-tenth that of Earth's. There is virtually no water or oxygen in the atmosphere.

Dr. Salisbury says despite all these handicaps (considered from the Earthling's point of view), life could survive. In fact, he says it probably could thrive.

A high form of plant life would best account for the color changes on the planet as it goes through its seasons. In many respects, higher plants would be more adaptable to the harshness of the conditions than the lower forms.

If the higher forms exist, then animals that eat them might exist. And if there are animals, why not humans? Humans, he says, would be the best explanation for bringing a water supply to the plant and animal life near the equator from the Martian poles (although the "canals" we see through the telescopes are probably not water carrying).

Going further -- and he admits he has gone pretty far already -- if humans can build pipelines, why not rockets and satellites, which brings Dr. Salisbury to Phobos and Deimos, the two satellites discovered in 1877 circling Mars.

These satellites circle differently -- in circular, equatorial orbits -- from the satellites of any other planet, he says. Further they were not visible in 1862 but were in 1877. Does this not suggest, they were put in orbit in the interim? They have been visible since.

None of this is direct evidence for life or intelligent life, Dr. Salisbury said, but it is enough evidence to justify further considerations to landings in earth space programs.

AS A NOTE OF INTEREST: Dr. Salisbury has been speculating on life on or off the earth for a good share of his 36 years. As a boy he worked as a naturalist in camps near his home town of Salt Lake City, Utah. As a Caltech graduate student he began tackling problems in astronomy from a botanist's viewpoint, producing a number of papers. A professor of plant physiology at Colorado State University, he has been running three research projects. One is on flowering and the "biological clocks" of plants (their inner timing mechanism); one on alpine plants (Martian prototypes?); and one on space biology (his verdict on a space traveller's ability to live on algae: "It'll never work!"). Currently he has packed himself and family (wife and four children) off to the University of Tübingen, Germany, for a years research in his favorite subject: biological clocks. He says, "Solve the mystery of when and why a gene suddenly comes to life and starts a plant flowering, and you will have cracked one of the fundamental problems in biology."