



Lane/Enterprise Science News

Extraterrestrial life (if there is any) and us

If there are other intelligent beings, will we ever hear them? Are they responsible for our being here? Are we specimens in their cosmic zoo?

by Dietrick E. Thomsen

Readers of science fiction know that there is an abundance of living creatures of all possible shapes, sizes and colors inhabiting planets throughout the universe from Arcturus to Volta, from which little green men looking surprisingly like German infantrymen came to conquer earth, and reduced the surviving earthlings to a hazardous existence in the subway tunnels of Manhattan.

The literary tradition of extraterrestrial life is just about as old as a correct understanding of the solar system, if not older, but what observational science has had to say on the subject has been mostly negative. The latest

negations involve close-up looks at Mars and Venus, which seem to preclude the existence of any higher forms of life on them (though small organisms are not ruled out).

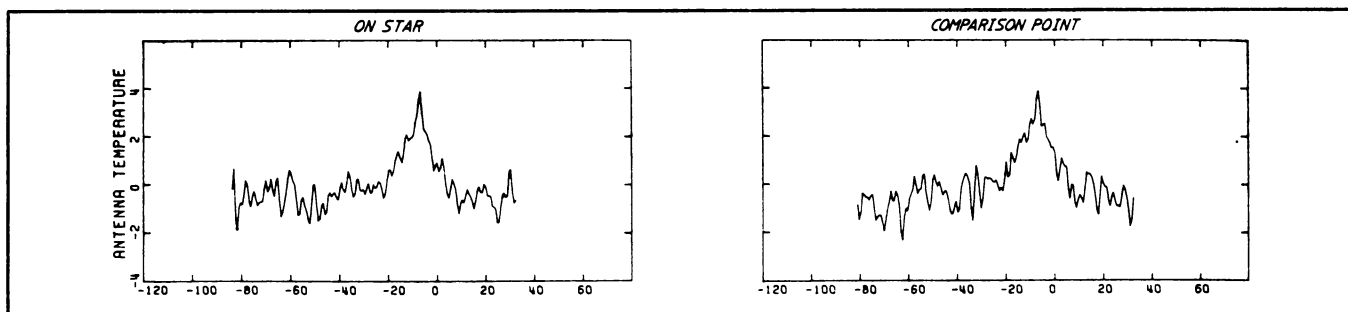
If there are no LGM's in our own solar system, the multitudes of planets belonging to other stars remain. Now that the capability of searching is upon us, searches are being made from time to time. An extensive and concentrated program of looking has been recommended by an international conference of distinguished scientists and humanists, which was held at Byurakan in Armenia two summers ago (SN: 10/2/71, p. 223).

Along with the searches now come conjectures and speculations by scientists, some of which more than replace the vanished canal-side cities of Mars and the Amazonian jungles of Venus (peace to Edgar Rice Burroughs): Was the origin of our life not on earth but elsewhere, and was the earth deliberately colonized by intelligent beings from somewhere else? Could we similarly colonize other planets? Have we been placed in a kind of zoo or galactic wildlife preserve by more developed civilizations in the rest of the galaxy?

The way to look for evidence of other civilizations is to look for radio

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signals that might be an intelligent attempt to communicate with us. The most recently reported search of this kind was done at the National Radio Astronomy Observatory by G. L. Verschuur and is reported in a forthcoming issue of the journal *ICARUS* (Vol. 19, p. 329).

Verschuur searched in the directions of 10 nearby stars for possible signals at the neutral-hydrogen resonance frequency, 1,420 megahertz (21 centimeters wavelength). This frequency was suggested years ago because it is a natural resonance line that any civilization with radio astronomy will have discovered, and it was therefore tempting to see it as a possible frequency for an interstellar recognition signal.

Time has made some holes in the 21-centimeter argument. Since the suggestion was made, dozens of resonance frequencies of a large variety of substances have been discovered, and the hydrogen one no longer appears unique. Verschuur points out another objection: An advanced civilization would presumably be doing radio astronomical observations, and for that reason they may have protected the waveband around the 21-cm line and not be doing any broadcasting at that wavelength.

Nevertheless, Verschuur made the search at 21-cm, not having a better suggestion. The results were negative in the case of all 10 stars. Verschuur calculates that, depending on the distance of the star and the telescope he was using, he could have detected signals of hundreds of kilowatts or megawatts power provided they were beamed toward the earth.

That assumes a great deal. It would mean that intelligent beings had determined that our sun was likely to be accompanied by a viable planet and were trying to see if they could contact us. In the same issue of *ICARUS*, Carl Sagan of Cornell University suggests that civilizations that have advanced technologically far beyond us may have developed an entirely new technique of communicating and have very little interest in communicating with us by such an antique means as radio signals.

If this communication breakthrough lies 1,000 years in our future, Sagan

Verschuur/Icarus

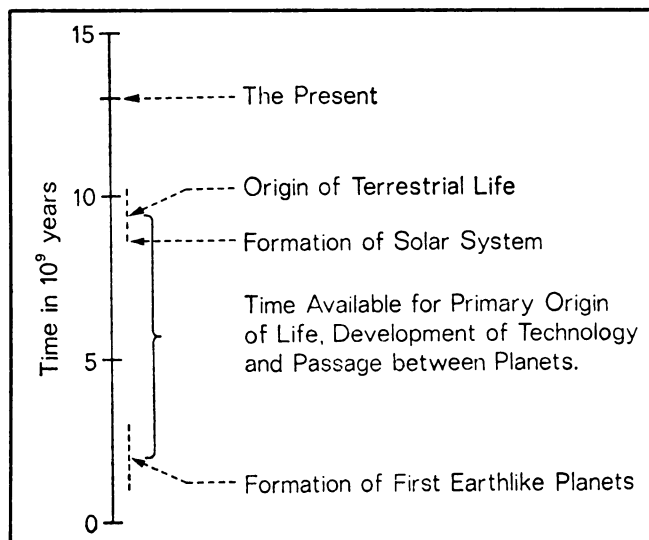
21-cm scans in the direction of Tau Ceti and away from that star show no difference, hence no intentional signal (above). Timetable shows possibility of earth's colonization (right).

Crick and Orgel/Icarus

figures, then only one-ten-thousandth of the civilizations in the galaxy are likely to be accessible to us by our means, and the mean distance to the nearest such society is about 10,000 light-years. This implies, he says, that a search of our galaxy would need much larger telescopes or arrays of telescopes than now used. Smaller telescopes might concentrate on nearby extragalactic systems "to detect the very small fraction of very advanced societies which may choose to make their presence known to emerging civilizations via antique communication modes."

All communications by members of a different galaxy would come to us from the same direction, which is why Sagan thinks looking at other galaxies may be profitable. Within our galaxy signals just may not be beamed in our direction. One of Verschuur's conclusions is that "any detection of signals from another civilization will most likely be an accidental one in the sense that we will pick up signals not meant for us."

One sort of signal not meant for us would be the domestic transmissions of another civilization. Every civilization that has radio is surrounded by a radio halo consisting of its domestic signals that extends as many light-years out as the number of years the civilization has been using radio. Both the American Project Cyclops held under NASA auspices in 1971 (SN: 10/2/71, p. 223) and the Byurakan conference recom-



mended building a huge array of radio telescopes to detect such transmissions. If a distant civilization were not sending out directed recognition signals—and since we are not, why assume that they are?—its existence could be determined that way. It's possible that we have already been found this way, and that on a planet orbiting a star some 40 light-years away a group of radio astronomers is eagerly awaiting the next episode of "Our Gal Sunday."

Even if we have been found, and even if we find another civilization by eavesdropping, its people may not be trying to communicate with us and they may refuse to reply to any signal we send. John A. Ball of Harvard, Mass., suggests the reason we're not getting any signals is that our fellow inhabitants of the galaxy may have put us into a kind of galactic zoo or wildlife preserve. Communication with us may be forbidden so as not to disturb our ecology and foul up the observations of behavioral or biological scientists of other worlds. A more "morbid and grotesque" possibility is that we may be in a laboratory situation, being managed by some extraterrestrial beings.

Finally our own existence may be proof of the existence of intelligent beings elsewhere. Life is not now being spontaneously generated on earth. Most evolutionists believe that it was spontaneously generated long ago, but perhaps it never was. Perhaps the earth

was infected from elsewhere. The noted molecular biologist Francis H. C. Crick of Cambridge University in England and L. E. Orgel of the Salk Institute for Biological Studies in San Diego make the suggestion in a paper entitled "Directed Panspermia."

"Panspermia" is the name for an old idea that life arrived here in the form of spores drifting through space driven by light pressure from the central star of another solar system. What we have learned lately about radiation in space tends to make people believe that any such spores would have been thoroughly zapped by the time they got here.

But Crick and Orgel suggest that the spores may have come as colonies of microorganisms sent in a protective spacecraft by intelligent beings elsewhere. The galaxy is old enough for earthlike planets to have formed and to have evolved civilizations before our earth formed, and therefore we could have been so colonized. In the future it may be possible for us to do similar colonization.

"Directed Panspermia" presents some biological evidence that could tentatively point to an alien origin for our own life. The first point is the uniformity of the genetic code. All beings on earth have the same genetic code. If life formed spontaneously on earth, it is likely to have done so independently at several times and places. Under such circumstances it is possible that the genetic coding of the descendants of one such protoorganism would differ from those of another. The universal genetic code could be compatible with a single ancestor, and Crick and Orgel argue that that could have been a sample of microorganisms dumped from a spacecraft.

Another point is the necessity of the element molybdenum to the chemistry of life. Molybdenum is very rare on earth, and thus its becoming important to life is a little surprising. It would be less surprising if our life had originated in a solar system where molybdenum was abundant.

"These facts amount to very little by themselves," Crick and Orgel write, "but . . . there may be other as yet unsuspected features which, taken together, might point to a special type of planet as the home of our ancestors." Then come a number of questions: Do the beings who sent the original microorganism colony still exist, or have they fizzled out or been burned out? Did they colonize other planets so that we have cousins somewhere around the neighborhood? If our progenitors' rockets had a short range, the universe may be lifeless except for a small village in our neighborhood of which we are one member. Will we ever find out?



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