

FUTURE *takes*

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Future (Re) Takes

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The May-June 2003 issue of *The Futurist* featured an article by H. Paul Shuch, titled, “The Search of Extraterrestrial Intelligence.” Here is a short review of that article and an update.

Summary of original article

In 1959, a young radio astronomer, Frank Drake, hit upon a seemingly ludicrous idea. Why not search for intelligently generated signals from the stars? He cautioned himself to do so quietly; this science fiction search might well be professional suicide. He assembled a crude one-channel listening station and began his search on two nearby sun like stars. Also in 1959, two Cornell professors, Giuseppe Cocconi and Philip Morrison, proposed the very same search in the scientific journal *Nature*.

Frank Drake’s first detection of intelligent life from other space was a classified military aircraft. Intelligent, extraterrestrial – you decide!

Today, the search for extraterrestrial intelligence (SETI) has emerged from the fringes to the scientific mainstream. In 40 year, thousand of people have conducted hundreds of searches for our cosmic companions, scanning billions of microwave and optical channels and spending millions of dollars in the process. But for all of that effort, we are today no more successful in detecting extraterrestrial intelligence then Drake was with his first search.

Efforts should expand to encompass all signaling technologies, whether or not we have achieved them yet at our present level of societal and technical adolescence. We should have an organized strategy for seeking out such probes launched by more-advanced societies and not limit our search to our current capabilities. Our present efforts should include a reach for the engineering marvels of our more-capable neighbors. Might our own starships someday leave a detectable residue? The search for the advanced propulsion signatures of others should be on our own agenda.

Astrophysicists have estimated that other civilizations could well be anywhere from a thousand to a billion years older than our own. If the first extraterrestrial civilization we encounter is at the upper end of that age continuum, SETI scientists will be lucky to even recognize its artifacts as manifestation of intelligence, let alone interpret them. Such an ancient race would be as far ahead of us as we are beyond bacteria.

If they lead us by, only a million years, then they might make their culture known to us much as we communicate with household pets. Optimally we are looking for an intelligence just a little bit more advanced than ours. An extraterrestrial intelligence that has beaten its swords into plowshares, has learned to harness its planet's resources in an environmentally responsible way, and has embraced genetic engineering with compassion and reason, to ensure the survival of its species through cooperation rather than conflict.

SETI is all about communication, not contact. Beings of an advanced civilization at the far end of the galaxy will still take 50 to 70 thousand years to get here, assuming they want to. Even so, we still inhabit a paranoid planet. Pressures from governing bodies and private citizens alike have prompted most scientific organizations and SETI research facilities to adopt a policy that prohibits interstellar transmission lest we give ourselves away. The act of listening no way reveals our position or our interest. Listening makes us no more vulnerable to invasion and domination than we would be turning a deaf ear to the universe. Given that SETI is a passive activity, it would seem we have nothing to lose in listening.

Where will SETI be in four more decades? Human technological progress (which SETI both reflects and stimulates) has been exponential. In all likelihood, our receivers will soon span the electromagnetic spectrum, from radio through microwaves into the infrared, across the visible, ultraviolet, X-ray, gamma ray, and cosmic ray spectra, all in real time. We are developing technologies today that will enable us to see in all directions at once. Forty years from now we will be scanning farther out in time and space than Drake ever dreamed possible. If there are electromagnetically polluting civilizations out there, surely we will have detected their photonic debris. Or perhaps it could well be that as civilizations advance they, become, by design or change, effectively invisible. In that case, 40 years from now we'll have arrived at an epiphany: We are not along, but we might as well be.

Update

Here are some of the activities that SETI is involved with today. Frank Drake is now the Director for the Center for the Study of Life in the Universe or LITU. This SETI research center asks the following questions: How many planets exist which might support life? What is required for life to exist? How does life start? How does it evolve, and what creatures can evolution produce? How often do intelligent creatures appear?

SETI/LITU scientists utilize an automated telescope for this research in Antarctica, where almost six months of continual winter darkness provides ideal observing conditions. In the near future scientists will participate in the Kepler Spacecraft Mission, which will achieve, for the first time, the level of sensitivity required to detect planets the size of Earth.

Today the search for extraterrestrial intelligence is not limited to earth like planets rotating sun like stars. Research has found a greenhouse effect made by miles of ice on the satellite Europa of Jupiter. The Sun's brightness on Europa is only a few percent of that on Earth. But there is more liquid water there than in all the oceans of Earth combined. Could there be life in this giant ocean? SETI/LITU scientists are exploring this possibility, both in theory and in the planning of missions to Europa to search for signs of life.

SETI researchers are now exploring the planets of dim red dwarf stars, also called M stars. Long neglected as targets for SETI searches, they comprise eighty percent of the stars in our galaxy. The possibility of habitable planets around M stars is all the more intriguing given the recent discovery of a planet around Gliese 876, an M star located just 15 light years from Earth. With the recent announcement of a solid rock planet seven to eight times the Earth's mass circling an M dwarf star, the chances for

habitable worlds seem greater than ever. “It may well be that there are far more habitable planets orbiting M dwarfs than orbiting all other types of stars combined,” explained Frank Drake.

SETI Institute scientists study “extremophiles,” the life existing in extreme environments, to explore the possible limits of life on other worlds. Researchers are studying likenesses between early Mars and Chile’s parched Atacama Desert as well as other locations around the Earth. SETI scientists are researching life’s possibility at these locations and also plan to monitor the hazy atmosphere of Titan during the descent of the Huygens probe. The Life in the Universe Center is conducting perhaps the broadest program of any institution addressing the origins and nature of life in the universe. SETI/LITU hopes to contribute to the understanding of some of the oldest and most profound questions of science and philosophy.

You can learn more about SETI at <http://www.seti.org>.