



Section III

Who Said What: A Summary and Eleven Conclusions

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Introduction

This seminar, organized by the Foundation For the Future, took place on July 31 and August 1, 1999, in the same location as the Bioastronomy '99 Conference. It focused on the long-term implications of a potential dialogue with an extraterrestrial civilization. The following topics were addressed in a discussion format:

- The impact of any practical information and advice that we receive.
- The impact of new insights, understanding, and knowledge about major questions that go far beyond ordinary, practical, day-to-day matters.
- The impact of a transformation in our view of ourselves and our place in the universe.
- Any other significant impact or effects, either positive or negative.

- What should humanity do NOW in order to maximize the positive long-term impact from an eventual dialogue—in order to achieve the greatest possible benefits for our culture, science, world-view, and long-term future?

The coordinator of the seminar was Allen Tough, University of Toronto.

Bob Citron opened the meeting by saying that the Foundation For the Future is interested in how our collective culture will respond to contact over the coming millennium.

Allen Tough opened the discussion by noting that there are a number of ways of searching for extraterrestrial intelligence (SETI), and that any of these might be successful, at any time into the future, in making an unequivocal detection. One consequence could then be a deluge of information from a society far in advance of ours. Some early studies have addressed what might be the immediate and near-term effects of the discovery. But Tough observed that the major impact would probably develop over decades, or centuries, and could have a profound effect on the evolution of our own civilization into the future. He therefore invited the participants to leapfrog over the near future and consider possible consequences of the detection over a thousand years by examining, in a group discussion format, the topics given above.

Topic 1 dealt with the impact of any practical information and advice that we receive. Claudio Maccone noted that they could have mastered superluminal string theory, unifying all known forces of nature, and would therefore know how to harness the huge energies connected with the zero-point field, and how to achieve faster-than-light travel. We should

therefore be ready to decipher such information by theorem-proving and other advanced techniques. If it were then possible to create wormholes, we could revolutionize interstellar communication and achieve a much more rapid dialogue. This would be a practical impact of extraordinary importance. Jill Tarter asked why we should communicate through the wormholes with photons rather than baryons, that is, spaceflight of the type envisaged in Sagan's novel *Contact*. Maccone said that photons were a great deal easier. John Billingham recalled Oliver's calculation of the energy needed to transfer a certain amount of information by spaceflight was 10^{40} greater than that needed for electromagnetic waves.

Guillermo Lemarchand argued that advanced societies, having long since passed their level of technological adolescence, would have a high level of "cosmo-ethics." This would mean that they themselves would be unlikely to attempt ecologically threatening projects like Dyson spheres or 10^{26} Watt omnidirectional transmitters, and that they would not want to pass on to emerging civilizations the knowledge of how to achieve such unrewarding endeavors. Therefore, they would likely pass information to us, or to other civilizations, in stages, so that there would be time to absorb and assimilate the knowledge in discrete increments. In other words, they would have chosen deliberately not to put our evolution and societal life expectancy in danger.

Therefore they will not transmit to us until they have detected us. If this is correct, we will only be able to receive from a distance $R_t < 35 + T_f/2 + \tau$ light-years, where R_t is the distance at any time t in the future, T_f is that time t expressed in years, and τ is the time the society needs to analyze our behavior and degree of evolution. So in 2053, with $\tau = 5$, the distance $R_t = 67$ light-years. Lemarchand concluded that Project Phoenix is best suited to get a high information content under these circumstances. (Note: This is rather a pessimistic scenario in that we will not hear from anyone, except for leakage, beyond R_t , and success in the near future would be achieved only if there were civilizations close to us.)

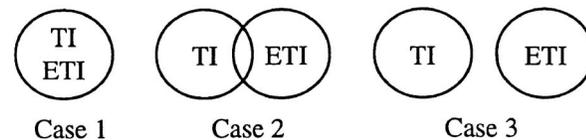
In the discussion that followed, Douglas Vakoch noted that this scenario assumes that ETI ethics are something like our own, and asked about the dependence of ethics on one's biology. Or if they have gone beyond the stage of biology to artificial intelligence, what then? Tough said it would be interesting and important to learn what their ethics actually are. Eric Chaisson said the ethics issue is huge. We have to develop our own, rather than from ETI, and if we do

it right, we will survive. But Tarter said it is most important for us to receive information about ways of surviving one's technological infancy.

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It was agreed that ETI might not have the same motives and behaviors as we do. They may be developing along a different evolutionary pathway and have no interest in contacting others. On the other hand, should they be interested in communicating with us, one of the most important practical results of contact would be the knowledge that it is possible to survive far beyond our own level of evolution, and perhaps how they did it.

Topic 2 addressed new insights: knowledge and understanding of the big questions and mysteries of the universe that go far beyond practical day-to-day matters. Against the background of epistemology and objective knowledge, Steven Dick asked whether we and ETI perceive the universe in the same way. There are three alternative cases:



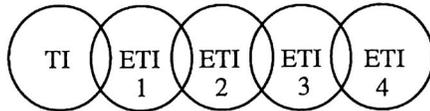
Case 1 holds out hope for easy dialogue and agreement. Case 3 implies such complete separation of sentience or mental processes as to prevent dialogue, or the mutual examination of objective knowledge.

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The problem of objective knowledge bears on the possibility of communication, on the role of language, and on those aspects of the universe that have the possibility of verification. Knowledge must be distinguished from belief, which may have no basis in the objective world; one would not expect extraterrestrial religious belief, for example, to take the same form as on Earth, though the existence of God may be an objective question. If contact is successful, a major task over the next millennium will be to syn-

thesize the knowledge of many worlds. The nature of this task will depend greatly on which of the three cases above turns out to be most common among galactic civilizations. Ben Finney said that the better we understand each other's jokes, the closer we will be to Case 1.

Vakoch drew up a fourth case for overlaps of objective knowledge:



Case 4

Finney observed that this is known in anthropology as a *dialect chain*. (Note: It is possible that our first contact with ETI may be like Dick's Case 3, but that with further discoveries of additional ETIs, one might achieve understanding and dialogue through these additional ETIs, each of whom has Case 2 overlaps with the others and us. Or we may learn from ETI No. 1 about all the others even though we have not detected the others ourselves.)

Tarter reminded everyone that any ETI we detect will likely be far older than we are. She listed some implications as follows: First, it is possible to survive one's technological infancy. (Note: This now reappears as an answer to a major fundamental question as well as important practical new knowledge.) Second, they may have a well-developed empirical field of study that can define critical bottlenecks and elaborate different ways through them. Third, they may have survived the red giant phase of their star. Fourth, their longevity is at odds with organized monotheistic religions typical of Earth. Fifth, there may be something like a universal religion, and there will be a highly established code of ethics. Sixth, they may tell us how it is possible to change from the primitive "My God versus your God" conflicts on Earth to a more stable universal understanding.

Lemarchand raised the question of religious issues in connection with the long-term impact of the discovery of ETI. He pointed out that all religions on Earth have common "Principles of Fraternity." On top of these is often superimposed the ritual dogmas of individual church power structures, sometimes resulting in control by an elite. If we learn that an ETI species has different or no thoughts about God, this will not generate reactions or conflict except among those terrestrial religions that are fanatical about their dogmas. But if we learn that there are some uni-

versal "Principles of Fraternity" like the universal laws of physics, then Lemarchand imagines a stimulating revolution of the most positive kind in terrestrial thinking about religion as a whole.

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In the discussion of these Topic 2 papers there was some agreement on the untoward effects of the aggressive and autocratic aspects of the Adamist religions. Albert Harrison said that the revolution in religious thought could well be a slow process, especially if the information from ETI came in slowly. Keiko Tokunaga noted that in the Buddhist sutras there is some evidence that contact has already occurred. Vakoch pointed out that ethics could evolve differently for ETIs who might live for 100,000 years, and that the corollary is that the emergence of universal ethics (as an extension of the global ethics envisaged by Chaisson) might facilitate great longevity for individuals and species as a whole.

Case 3 scenarios were envisaged for ETIs whose biological evolution has been quite different. For example, said Vakoch, how would we understand ETIs whose main means of communication was olfaction? Dick quoted Kuhn's opinion that we can easily talk past each other if we have different paradigms. Finney elaborated, with the example that we might have had a Case 3 situation at this meeting if post-modernists had been present. Lemarchand reminded us that Piaget said that the circles would eventually merge.

Tarter quoted Dawkins' firm belief that evolution on Earth is the end result of predator/prey relationships. Billingham felt that a majority of exobiologists would postulate the same for ETI, up to our stage of evolution today. But Dick said different ET environments could lead to different pathways for ETI evolution. Vakoch thought that evolutionary stories could be the basis for interstellar messages.

Tarter said that the major fundamental question is whether ETI exists: detection of their signal would provide the answer. Everyone agreed that the knowledge that they had achieved great longevity was another answer to the fundamental, as well as practical, question as to whether long-term survival is actually possible.

Topic 3 was concerned with changes in our views of ourselves. Paul Davies focused on the fact that religion is already being transformed by the prospect of

the existence of ETI. While theologians may express a relaxed view of the possibility of ETI, they may be hiding some deep concerns because of the geocentric or homocentric nature of many religions, especially Christianity, vulnerable because of the unique position of Jesus Christ as God incarnate. The shock will be worse if ETI turns out to have achieved, by directed evolution, a more spiritual or saintly state far beyond ours.

Finney imagined a crisis in the middle of the Third Millennium. SETI would already have been successful, the field of comparative exosemiotics would be maturing, and Tsiolkovsky biospheres would be capable of cruising to the stars at 0.3 c. But the sobering news on the interstellar communication channels is that many star systems are occupied by advanced ETIs who do not want us, have little interest in us, and are not inclined to give us tutorials. Whither now, self-anointed *Homo sapiens*?

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Harrison asked some interesting new questions about social comparisons, identity, and self-esteem a millennium after the discovery of ETI. While enthusiasts paint rosy pictures, they rely on the hope that ET will treat us as equals, that we will continue to compare ourselves with one another, and that our changing cultures will retain distinctive elements. But the opposite of all of these could dominate. We should study historical analogs further, searching especially for positive outcomes of contact in the areas of the amicable co-existence of caste systems, positive lessons from the colonial experience, subjective determinants of self-esteem, and preservation of identity following contact between cultures.

Gender parity was taken by Kathleen Connell as a specific question of the societal impact of an extraterrestrial cultural exchange. Specifically, would ETIs embody a different gender construct? In turn, would a radically different gender model positively impact the existing disparity in human society? Connell listed variations in genderism that ETIs may manifest. Her conclusion was that some social inequities, such as gender-based disparities, may be integrated only by the introduction of off-home-planet genetic paradigms and role modeling.

There was much discussion of the remarkable change in our view of ourselves over the last few hundred years. Before that, as Davies said, human beings

were thought to have been created by God and to occupy a central position in the universe. Today that view has largely disappeared. Chaisson called it a remarkable U-turn in everything from the Big Bang to intelligence. Tarter said it was now reasonable to think that we are actually made of star stuff. (Note: One wonders whether similar dramatic changes may await us in the coming millennium with or without the advent of contact with ETI.) Harrison cautioned that the transition was not exactly smooth, and we should examine the bumps in the curve. Billingham referred to the discovery of the lost knowledge of the ancient Greek civilization in the Moorish civilization in Spain in the 12th century. There are two points here: The first is the stimulus this gave to the start of the Renaissance. The second is the analogy with our discovery of new knowledge from ETI. (If there is any reality to the analog, then contact with ETI could bode well for a new Enlightenment for us.) Dick agreed with the importance of the discoveries in Spain, but cautioned against predicting the future from perceived analogs with the past.

Connell said that some people believe that SETI has elements of a secular religion. Billingham asked if “secular religion” was not an oxymoron. Baseball, said Finney, has been described as a secular religion. Tarter said SETI has indeed been accused of being a secular religion. But SETI people are hard-nosed scientists who are prepared to accept that we are alone if that could be proved. So our beliefs are subject to test, and change on the basis of hard evidence, which is not the case for religions.

Topic 4 covered long-term effects that are primarily negative. For the sake of argument, Chaisson postulated no positive effects from contact with ETI over the coming millennium. For electromagnetic contact, there will be a small cadre of academics publishing on ETI in cyberspace journals, but the vast majority will be consumed with the continuing travails of life on Earth. Physical contact would be much worse, and lead to a neo-Darwinian subjugation of our culture by theirs. Advanced societies might dominate the less advanced, just as has happened in many cases on Earth.

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Ragbir Bhathal agreed. ETIs would want to control the resources of the universe for their own ends, just as has happened on Earth. Physical contact is not actually necessary, because proxies can be installed

by ETI, just as the Soviet brand of Communism relied on home-grown dictators in East Asia. The culture shock will be severe and disruptive, and our institutions will fail. So it could be the end of civilization as we know it.

Tarter noted that the real impact might be to trivialize the severe differences between humans. Lemarchand noted that President Reagan said that a hostile ETI could unite us like nothing else. Lemarchand also made the important point that their domination of us may be the natural order of things. Davies was worried that bad guys might actually prevail. Connell warned that evolving into a monotheistic culture might threaten democracy and the rule of law.

Topic 5 explored the really practical question of “What can we do now?”

Vakoch pleaded for a recognition that long-term impacts of a dialogue with ETI may be determined to a significant extent by our initial response. We would do well to ponder all the issues in advance. Special attempts should be made to construct messages ourselves, not just in terms of mathematics and science, but in the arts. Musical intelligence is a candidate, witness the paper by Von Hoerner on three of four alternative scales of possibly universal significance. Do not forget the Buddhist question: “What is the sound of one hand clapping?” Perhaps part of the message should itself be a work of art. Billingham said that we should attach an asterisk saying that this is not the real thing. Vakoch said it could be argued that the asterisk might go on the science and math saying it was not the real thing. He concluded by saying we should look for ways of opening up barriers so that Case 3 situations might be nudged towards Case 2 and then to Case 1.

Tough worried that if they are here, they may be in Case 3 because there is no contact. Davies reminded everyone that worldviews can change dramatically in 100 years, witness the arrival of the Information Age. Vakoch said that we should be sure to use environmental phenomena, such as pulsar locations, as common reference points so that those, at least, are in Case 1.

Citron emphasized that over the next thousand years we will be modifying our own existence and capabilities. We may gradually move towards some type of humanoid machinery, or machine intelligence, endowed with great longevity. How will this help us to detect ETI, or to conduct a dialogue with ETI? Davies pointed out that genetic engineering may be used to eliminate criminal or antisocial

behavior, and that the distinction between nanotechnology and biotechnology will soon disappear. Further, ETI will already have done all this.

There was much concern about what we might do, and what they might have already done, to species behavior. For example, will the exploration gene be deleted, enhanced, or left as it is in humans of today? Citron and others hoped that positive aspects of human behavior would be programmed into cyborgs, if there are cyborgs, so that it is not lost. Davies proposed a Committee on Urges, to examine what should be done with each. Tarter reminded everyone that it may be possible in the future to teleport the complete intelligence of a human being.

Tough presented arguments for augmenting SETI in five areas:

1. Pursue a variety of means for searching the solar system and our planet for physical evidence of an extraterrestrial object or its effects.
2. Invite contact through invitations to ETI on the World Wide Web.
3. Encourage contact by becoming sufficiently prepared.
4. Search for evidence of astroengineering projects and their by-products.
5. Use radio and optical SETI to detect artificial signals.

He has already signed up a group of 40 SETI scientists for Item 2.

Finney said we should pursue an archeological search for artifacts in the solar system. Lemarchand encouraged everyone to spread the word about SETI signals buried in astronomers’ existing data, perhaps squirreled away in their bottom drawers. Tarter agreed we should systematize such retrospective searches. Maccone envisaged searching for an ETI probe in a sphere of radius 550 AU from the Sun—which might be the location of their communication antenna at the gravitational focus of the Sun.

Billingham argued for an expansion of the current small group studying the societal issues surrounding the contact scenario. Bring on board additional experts in all the disciplines to stimulate discussion. Vakoch will serve as the Institute’s focal point for collecting names of good candidates. At the moment we are 25 years behind the SETI physical scientists and engineers in achieving respectability. He passed around the first publication of the SETI Institute’s SETI Press, entitled *Social Implications of the Detec-*

tion of an Extraterrestrial Civilization,¹ put together some years ago by the Workshops on the Cultural Aspects of SETI. This was a group of distinguished scholars from most of the disciplines involved in SETI and Society. One of their recommendations was to conduct a broader international conference on SETI and Society, funds for which are now being sought. Billingham said also that most of the existing references on SETI and Society are included in the new SETI Press publication, and in Harrison's book *After Contact*,² and in the publications of Dick,³ Michaud,⁴ and others at the seminar.

In the discussion that followed, many suggestions were made for augmenting the SETI and Society base. These are included in "Contact: Long-Term Implications for Humanity," by Dick and Harrison. [See Section II, this volume.]

...we should do more to prepare for a dialogue by becoming more receptive, breaking away from our individual egos, using our basic intuition, becoming more compassionate, and finding places where contact could be made.

The final paper was given by Tokunaga and dealt with the significance, in terms of Zen Buddhism, of how we send signals to each other, and how we receive and interpret them. This has major importance for our own interactions here on Earth. There are still different ways of looking at the world here—witness the different conceptual frameworks of Buddhism and the Western world. Could some of these differences be analogs of what we might expect in encounters with ETI? In any event, we should do more to prepare for a dialogue by becoming more receptive, breaking away from our individual egos, using our basic intuition, becoming more compassionate, and finding places where contact could be made. She said it was important to resolve our own differences. Perhaps this is why we have not heard from them. She described the cycles of life in the Buddhist philosophy, and left open the possibility that one could include extraterrestrial life. ETI is clearly not excluded in Buddhism.

Tarter asked how the news of a detection would be received in the Buddhist temple. Tokunaga said there would be a wide range of reactions depending on individual perceptions and intuition. The results of the encounter will depend on who you are. Finney wondered if they would really want to contact us, given all our current problems. Tokunaga noted that

Tarter wants an answer to the question, "Are we alone?" and everyone seems to be pining for contact. In the Buddhist view, the eating of garlic is forbidden, because it is considered to cloud the mind. Perhaps our group should follow suit and then be able to come up with some clearer ideas and insights.

In closing the meeting, Tough said that detection would be a major event of the next thousand years, and that we should continue to search and to examine the long-term impact of detection.

Citron said that this topic might be worth repeating, with follow-up discussions in two or five years.

Conclusion

This meeting was conducted in a brainstorming format, and did not attempt to cover all aspects of the long-term societal implications of contact. Areas that will surely be explored in future meetings are: social attributes and context over the years before, during, and after detection; the desirability, or not, of transmitting from Earth, either after we have detected ETI or *de novo*; interstellar languages; political and institutional processes and arrangements for trying to reach consensus on transmissions from Earth; and more details of the role of education and the media.

In those areas that were discussed, some general findings emerged:

1. A detection would have profound practical and long-term implications for our civilization.
2. At the very least, we would have answered the question, "Are we alone?"
3. The ETI we detect will likely be much older than we are, proving that a civilization can achieve longevity.
4. We may be faced, either gradually or rapidly, with a flood of information from an advanced civilization.
5. This information may be difficult to comprehend, either because it is so advanced, or because it is a totally different epistemological frame of reference, or both.
6. We should prepare for detection by further studies involving people from many walks of life, by closer self-examination, by education, and by the pursuit of the topic in bodies such as UNESCO and COPUOS, or by the establishment of a World Council.

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7. We should consider the content of a transmission to ETI with great care, since the course of subsequent dialogue could be deeply influenced by the composition and tenor of our first message.

8. We should continue studying historical analogs of contact, but not rely on them as predictors of the future. We should analyze analogs involving the positive consequences of a less advanced society communicating with a more advanced society, especially where there is no physical contact.

9. The implications for religions on Earth are already being felt before contact, and may be of great import for a long time after contact. It is possible that fraternal principles found in most terrestrial religions may have been blended into a universal code of ethics by ETI.

10. Over the next millennium we will develop increasing ability to control our own evolution, and may see the advent of cyborgs and machine intelli-

gence. Hopes were expressed that we will not lose desirable characteristics, for example, altruistic or exploration genes, in the process. We should be prepared for ETIs to have gone through such evolutionary steps long ago.

11. The millennia after contact could be a normal evolutionary phase for citizens and civilizations of the universe.

References

¹Billingham, J., et al. (1999). *Societal Implications of the Detection of an Extraterrestrial Civilization* (SETI Press, Mountain View, CA).

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³Dick, S. (1996). *The Biological Universe: The Twentieth Century Extraterrestrial Life Debate and the Limits of Science* (Cambridge University Press, Cambridge).

⁴Michaud, M. and Tarter, J., Eds. (1989). Special Issue of *Acta Astronautica: SETI Post-Detection Protocol* (Pergamon Press, Oxford, UK).

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