

## IT'S ABOUT THE EVIDENCE

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### ABSTRACT

When the best physical scientists study the universe around us, they report it as it is, not as they wish it would be. Yet some do not observe that standard when they predict the nature of an extraterrestrial civilization or the consequences of our coming into contact with such an alien society. Too often, we get opinions instead of systematic analyses drawing on the only data base we have – human history. Many authors have been very selective in choosing analogies from the human past, ignoring much of the evidence provided by historians. Yet, as one astronomer acknowledged, assuming ourselves to be average has the highest probability of being right. This has significant implications for the debate about Active SETI.

Our predictions about the consequences of contact are necessarily speculative. Nonetheless, we should seize the opportunities we have to introduce greater objectivity. Historians, with their knowledge of and perspective on human behavior in contact situations, can make a valuable contribution. It is time for the participants in the Active SETI debate to acknowledge the relevance of the human experience.

### INTRODUCTION

As historians of astronomy, you are well aware of the centuries-long debate about the possible existence and nature of extraterrestrial life and intelligence. Some of your colleagues – particularly Steven Dick and Michael Crowe – have given us fine intellectual histories of this question.<sup>2</sup>

In each era of the debate, there have been believers, deniers, and agnostics. At times, the tone of the debate has been emotional. This is not surprising when we recognize that we are dealing with an unproven belief. Yet that belief is, in principle, scientifically verifiable.

The factors that influence this debate have changed over time. Consider the impact of scientific and technological advance. In the past fifty years, we have seen what was once impossible – sending and receiving technologically generated signals across interstellar distances – become possible. Small but determined groups of scientists have been searching for evidence of alien technologies, primarily radio signals, in a kind of CSI: Galaxy.

More recently, another advance that had been considered impossible – detecting planets around other stars – has been achieved. The long-assumed plurality of worlds has been proven, though not the plurality of inhabited worlds. Within this revolution of near-Copernican magnitude, the search for alien Earths is well under way.

Our recent ability to reach the other planets of our own solar system through spaceflight – once considered impossible -- implies by analogy that some other technological species might have comparable capabilities. Scientific and engineering studies suggest that, within the next hundred years, we may achieve what some still consider impossible – sending robotic probes to nearby solar systems. This implies that other technological civilizations, particularly older ones, may be able to do the same.

The debate also has been influenced by the intellectual and political trends of the time, particularly when estimating the probable lifetime of a technological civilization. During the Cold War, many authors were influenced by fears that nuclear warfare might destroy Humankind. Others have argued that population growth, resource depletion, and environmental degradation also imply short lifetimes for technological civilizations, reducing our chances of finding any.

The conclusions some people have reached about the existence or non-existence of extraterrestrial intelligence go well beyond the evidence, or more accurately the lack of evidence. We don't yet have enough information to answer the questions at the heart of the so-called paradox.

The desire for a quick, definitive answer to this ancient question may reflect impatience with ambiguity. That impatience fails to recognize that some things are not only unknown, they may not be knowable with the means presently available to us. As historian Michael Crowe put it, the ways of the universe are more difficult to discern than most inhabitants of our planet have been willing to recognize.<sup>3</sup>

## CONSEQUENCES

In recent decades, we have seen a growing number of speculations about what would happen if contact actually took place, whether through the transmission of information by signals or by more direct means. We now can say that there is a literature on the consequences of contact, in the form of science fiction and science speculation. Our speculations about the nature and consequences of contact are a vast thought experiment that draws on many different sorts of knowledge, and on many unproven assumptions.

Initially, this debate was dominated by astronomers who believed that the only possible form of contact was through the transmission of signals. Such contact would be risk-free, except for its intellectual and cultural impact.

The biggest change in the past thirty years has been the growing credibility of direct contact through robotic interstellar spacecraft. If there are more advanced technological civilizations elsewhere, some may already have this capability.

The possibility of direct contact requires us to widen the range of possible consequences. The issues raised by direct contact are not primarily scientific; they involve societal questions of some magnitude. The unwillingness of the SETI community to address the consequences of direct contact has left speculations largely to science fiction.<sup>4</sup>

## ANALOGY AND PROBABILITY

When the best physical scientists study the universe, they report it as it is, not as they wish it would be. Yet, when they discuss what extraterrestrial societies will be like and how they will interact with us, many have deviated from the objective observational standard. We often get opinions instead of systematic analyses drawing on the only data base we have – human history and behavior.

Obviously, we have a problem in predicting the nature and behavior of intelligent extraterrestrials: we have no confirmed data. Until we do, we have only two methods of analysis: analogy with ourselves, and probability based on the human example.

Many scientists have applied probability to the likelihood of our detecting evidence of extraterrestrial intelligence, in effect inserting their preferred numbers into the Drake Equation. Yet some have abandoned probability when they discuss the nature of alien civilizations and the way they will behave in a contact situation. Some have been very selective in choosing analogies from human history, excluding or ignoring much of the evidence.

## OPTIMISTS AND PESSIMISTS

Authors have expressed sharp differences of opinion about the potential consequences of contact; some have been optimistic, others pessimistic. Many optimists support the search for extraterrestrial signals because they hope that contact will introduce positive factors into human affairs. They *want* contact to have consequences for Humankind – the consequences they prefer, such as the transmission of knowledge that will make us wiser and solve our problems. The human hope for intervention from above – the desire to be guided, rescued, or punished by superior beings – remains very much alive.

Those who are optimistic about the consequences of contact draw on the most positive, least threatening analogies from our history. One analogy, popular during the early days of SETI, was receiving communications from civilizations separated from us in time, as in the Western rediscovery of ancient Greek and Roman knowledge that helped stimulate the Renaissance.

Many optimists have claimed that more advanced civilizations will be generous in sharing their knowledge, even eager to educate us. SETI pioneer Frank Drake expected an alien civilization to bequeath us vast libraries of useful information to do with as we wish. Carl Sagan imagined that we might have access to an Encyclopedia Galactica. According to one book, all the important questions in science, engineering, and social science will be answered for us.<sup>5</sup> A related prediction is that a more advanced civilization will help us to solve our current problems with a kind of interstellar technology assistance program, a grant of useful knowledge by a Prometheus from the stars.

Such predictions are implicitly connected with a recurrent vision of alien utopias that are intended to be models for our own future. Sagan, for one, imagined alien societies “in excellent harmony with their environments, their biology, and the vagaries of their politics, so that they enjoy extraordinarily long lifetimes.” Drake foresaw that we might learn general rules of civilization that we could apply to our own. The authors of the Project Cyclops report hoped that we would discover social and esthetic forms most apt to lead to self-preservation and a richer life.<sup>6</sup>

We must ask: where is the evidence from human history that supports these speculations? When have human societies been so generous, so altruistic? SETI Institute astronomer Seth Shostak acknowledged that aliens will have little biological reason to be altruistic, only intellectual ones.<sup>7</sup> I would add that few of us show altruism toward Humankind’s nearest relatives, the chimpanzees.

We also must ask another question: when have receiving societies been so welcoming of alien ideas? One need only look at the deep resentment of western modernity in other human cultures, particularly in Islamic societies.

Optimists assure us that there will be no risk in contact, either because we are insulated by interstellar distances or because advanced aliens will have benign intentions. Astronomer Paul Horowitz claimed that civilizations that don’t acquire the wisdom to control war will destroy themselves long before they can take to space, so the ones we are trying to contact will be, by definition, no longer threatening.<sup>8</sup> Where is the scientific or historical evidence that supports this statement?

Pessimists draw on less attractive analogies from our history, often invoking examples of a more powerful society disrupting a weaker one. Their concerns range from the cultural disorientation of receiving information from a more advanced civilization to the possible extermination of our species through direct contact.

Astronomer Robert Jastrow argued that contact between scientifically advanced civilizations and others typically results in the destruction of the less developed culture. International affairs analyst Fareed Zakaria gave us this analogy from our own history: “Within a hundred years of initial European contact, one trend was unmistakable and irreversible: these encounters changed or destroyed the existing political, social, and economic arrangements in non-Western societies.” If we have no choice in the matter, warned historian William McNeill, the end of human civilization as we have known it would be an expected consequence – especially in the case of direct contact.<sup>9</sup>

## PRESENTISM

One feature of some history writing is “presentism,” judging human behavior in the past by the standards of the present. In the modern debate about contact, we have seen different forms of presentism. Some authors have assumed that our time is fundamentally different from the past, that we have entered a more peaceful era, that we have put behind us the worst human behaviors.

To some extent, this reflects the different approaches taken by physical scientists and historians. Generalizations made by physical scientists may be based on a sampling that is highly concentrated in time; they need not allow for historical contingency.<sup>10</sup> Historians do not enjoy that luxury.

Some dismiss worries about the possible negative implications of contact as paranoia or Cold War thinking. Some have claimed that technologically advanced extraterrestrials already will have passed through a critical, one-time transition, that those who survived must be more peaceful and benign.

This is not what our own history tells us. Consider the question of conflict.

Many people in the Western world thought we had put international tensions behind us in 1991, when the Soviet empire collapsed. The terrorist attacks of 2001 reminded Americans that they are not exempt from history. Two years later, they went to war in Iraq. Now the United States is escalating its involvement in the Afghanistan war.

Conflict continues to be part of the human condition. Since the end of the Cold War, millions of humans have died in civil wars in the former Yugoslavia and in Africa. More people have died in the Congo than in any conflict since World War Two, particularly since the Rwanda massacres of 1994. The current estimate of 4 to 5 million dead in the Congo seems chillingly plausible.<sup>11</sup>

Well before the current conflict in Darfur, an estimated two million people died in Sudan because of the civil war between the Moslem north and the Christian and animist south. One million people died as a result of the civil war in Angola that finally ended in 2002. Excluding wars in Africa from our calculations would be implicitly racist.

Some of those who are optimistic about the consequences of contact try to get around these facts by claiming that more advanced beings will not share our faults, even that we humans must be uniquely evil. We have not one shred of scientific evidence to support those beliefs.

It is far safer to apply Sagan's assumption of mediocrity, to assume that we are neither the best nor the worst. Astronomer Sebastian von Hoerner too said that assuming ourselves to be average has the highest probability of being right.<sup>12</sup> The prudent course is to assume that while some intelligent species may be nobler than we are, some others may be more brutal. Consider the implications of post-biological societies described by Steven Dick and others. Would intelligent machines behave altruistically toward biological beings?

Assumptions about alien behavior have not passed the observational test. We have no evidence of what motivates intelligent extraterrestrials, or of how they would behave in a contact situation. If we insist on assigning our best qualities to them, we also must allow them to have our worst.

## THE FOCUSING ISSUE

In recent years, the debate about the consequences of contact has swirled around the issue of calling attention to ourselves by sending out more powerful signals than the Earth normally emits, in the hope of provoking a response. This practice is known as Active SETI, in contrast to passive listening.

Advocates of Active SETI argue that there should be no restrictions on sending high-powered signals because there is no risk. Others have warned that the possible negative consequences are immense and irreversible. "Those astronomers now preparing again to beam radio signals out to hoped-for extraterrestrials are naïve, even dangerous," wrote Pulitzer Prize-winning author Jared Diamond. "If there really are any radio civilizations within listening distance of us," he said in one of his books, "then for heaven's sake, let's turn off our transmitters and try to escape detection, or we're doomed."<sup>13</sup>

Some of us have proposed that Humankind address the pros and cons of this issue through a representative international process before sending more powerful signals. An editorial in *NATURE* put it this way: "While the chances of unpleasant consequences may be remote, they must be considered.

When technologies offer radical new possibilities, the people who have the privilege of playing with them have an obligation to consult widely about what those possibilities mean.”<sup>14</sup>

This is an opportunity to get people to think about what is in the best interests of the human species, and to act accordingly. Seeking contact with extraterrestrial intelligence is a species enterprise that should be conducted with our shared interests in mind.

## HOW HISTORIANS CAN HELP

In considering how societies of intelligent beings will behave in a contact situation, we must consider our experiences with the only history we know – our own. As psychologist Albert Harrison put it, we should study historical analogs, searching for the most probable outcomes of contact.<sup>15</sup>

It is time for the participants in this debate to acknowledge the relevance of human history. All of it, not just those parts we prefer to honor.

Historians can provide us with the evidence of actually happened when different human civilizations and different human societies came into contact – both the good news and the bad news. They can describe human behavior as it actually has been, not as we would prefer it to be.

Regrettably, the social sciences, including history, have had only a marginal influence on the debate about the consequences of contact. Few social scientists have sought involvement in these discussions. There may be several reasons, including a lack of funding for social science research in this area, and a perception that this kind of work is not respectable. The other side of this coin is that physical and biological scientists have not always welcomed social science involvement in this debate, apparently because of a widespread belief that social science has little to offer in the way of hard facts.

To be credible, analyses of human history must avoid idolizing some parts of our past while demonizing others. Arguably, the past civilizations we most admire are ancient Greece and ancient Rome. Yet both those societies practiced slavery, and both engaged in frequent warfare.

Former United Nations Secretary-General Kofi Annan recently observed that separate narratives about the Arab-Israeli problem have become intellectual prisons, paralyzing discourse and hindering understanding. The antidote, he argued, is grounded historical research. Such knowledge of history, such dispelling of public myths about the other, is a precondition to serious dialogue.<sup>16</sup> Similarly, we need to apply more firmly grounded history to the debate about the implications of contact.

## WHAT IS TO BE DONE?

First, we need a more systematic calculation of the potential benefits and potential risks of contact. We should reflect on the full range of possible outcomes, not just those we prefer. As Zakaria said about foreign policy, this is a matter of costs and benefits, not theology. One starting point might be the Rio Scale proposed by astronomers Ivan Almar and Jill Tarter, a framework for classifying the impact of contact.<sup>17</sup>

Second, we need thoughtful analyses of the direct contact scenario, which is poorly represented outside of science fiction. Our own history offers hundreds of examples of direct contacts between different civilizations and different societies. It is time for an agenda-free survey.

Third, we need forums for discussion that include social scientists as well as physical and biological scientists. That must include not only meetings, but also outlets for publication.

Fourth, we need non-Western perspectives on the implications of contact. In particular, we need more input from Asia. The world’s most populous nations – China and India – have played almost no role in the debate about the consequences of contact, nor has Japan.

Fifth, we need more input from historians. Here is my plea to the history profession: contribute serious work on historical analogs to contact. Bring greater objectivity to the debate by describing human behavior as it actually was.

In short, be scientists. As Jack Cohen and Ian Stewart wrote, science is the best defense against believing what we want to.<sup>18</sup> So is firmly grounded history.

I leave you with this thought, expressed by Carl Sagan in his final book. “The search for who we are...goes with a courageous intent to greet the universe as it really is, not to foist our emotional predispositions on it but to courageously accept what our explorations tell us.”<sup>19</sup>

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<sup>1</sup> Michael A.G. Michaud, *Contact with Alien Civilizations: Our Hopes and Fears about Encountering Extraterrestrials*, New York, Copernicus (Springer), 2007.

<sup>2</sup> Steven J. Dick, *The Biological Universe: The Twentieth Century Extraterrestrial Life Debate and the Limits of Science*, New York, Cambridge University Press, 1996; Michael J. Crowe, *The Extraterrestrial Life Debate 1750-1900*, Mineola, N.Y., Dover, 1999 (originally published by Cambridge University Press in 1986).

<sup>3</sup> Crowe, *op. cit.*, 559.

<sup>4</sup> For a succinct description, see Stephen Baxter, “Imagining the Alien: The Portrayal of Extraterrestrial Intelligence and SETI in Science Fiction,” to be published in the *Journal of the British Interplanetary Society*.

<sup>5</sup> Frank Drake and Dava Sobel, *Is Anyone Out There? The Scientific Search for Extraterrestrial Intelligence*, New York, Delacorte Press (Bantam), 1992, 159-160; Carl Sagan, *Cosmos*, New York, Random House, 1980, 291-315; Roger A. MacGowan and Frederick I. Ordway III, *Intelligence in the Universe*, Englewood Cliffs, New Jersey, Prentice-Hall, 1966, 250.

<sup>6</sup> Carl Sagan, *The Cosmic Connection*, Garden City, N.Y., Anchor (Doubleday), 1973, 241; Interview with Frank Drake in David W. Swift, *SETI Pioneers: Scientists Talk about Their Search for Extraterrestrial Intelligence*, Tucson, Arizona, University of Arizona Press, 1990, 85; Frank Drake, “On Hands and Knees in Search of Elysium,” *Technology Review*, June 1976, 22-29; *Project Cyclops: A Design Study of a System for Detecting Extraterrestrial Intelligent Life*, NASA CR 114445, 1972, 31.

<sup>7</sup> Seth Shostak, *Sharing the Universe*, Berkeley, CA, Berkeley Hills Books, 1998, 100.

<sup>8</sup> Quoted in Gregg Easterbrook, “Are We Alone?,” *The Atlantic Monthly*, August 1988, 25-28.

<sup>9</sup> Robert Jastrow, “What are the Chances for Life?” (review of Dick’s *The Biological Universe*), *Sky and Telescope*, June 1997, 62-63; Fareed Zakaria, *The Post-American World*, New York, Norton, 2008, 66; McNeill in Carl Sagan, Editor, *Communication with Extraterrestrial Intelligence*, Cambridge, Massachusetts, The MIT Press, 1973, 345.

<sup>10</sup> Walter C. Sweet, “Scenarios of Paleontology” (review of Gould’s *Wonderful Life*), *Science* 246 (3 November 1989), 680.

<sup>11</sup> Jeffrey Gettleman, “A Wound in the Heart of Africa” (review of Gerard Prunier’s *Africa’s World War*), *The New York Times Book Review*, 5 April 2009.

<sup>12</sup> In Michael H. Hart and Ben Zuckerman, editors, *Extraterrestrials: Where Are They?*, New York, Pergamon Press, 1982, 29.

<sup>13</sup> Jared Diamond, “To Whom it May Concern,” *The New York Times Magazine*, 5 December 1999, and Jared Diamond, *The Third Chimpanzee*, New York, Harper Collins, 1992, 214.

<sup>14</sup> Michael A.G. Michaud, John Billingham, and Jill Tarter, “A Reply from Earth?,” *Acta Astronautica*, Vol. 26 (March/April 1992), 295-297; “Ambassador for Earth,” *Nature*, Vol. 433 (12 October 2006), 606.

<sup>15</sup> See John Billingham, editor, “Summary of Results of the Seminar on The Cultural Impact of Extraterrestrial Contact,” in G. Lemarchand and K. Meech, editors, *Astronomical Society of the Pacific Conference Series* 213, 2000.

<sup>16</sup> Timothy W. Ryback, “Enter the Historians, Finally,” *International Herald Tribune*, 24 November 2006.

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<sup>17</sup> Zakaria, 224; Ivan Almar and Jill Tarter, “The Discovery of ETI as a High-Consequence, Low-Probability Event,” paper presented at the 2000 International Astronautical Congress.

<sup>18</sup> Jack Cohen and Ian Stewart, *What Does a Martian Look Like? The Science of Extraterrestrial Life*, Hoboken, New Jersey, Wiley, 2002, 209.

<sup>19</sup> Carl Sagan, *The Varieties of Scientific Experience: A Personal View of the Search for God* (edited by Ann Druyan), New York, Penguin, 2007, 221; “Sagan’s Familiar and Prescient Voice is Brought to Life,” *The New York Times*, 13 February 2007.