

# We Have Met the Alien, and He is Us

T.H. Ray

1209 Norwood Rd.  
Lansing, MI 48917  
E-mail: [thr@aol.com](mailto:thr@aol.com)

## Abstract

The first problem in detecting and confirming ETI contact is differentiating ETI from TI. The second problem is formulating a theory or set of theories, with testable hypotheses, which would allow such differentiation, and make meaningful the research data which results from such tests. This paper identifies the means of differentiation, and suggests the most likely disciplines in which theories might be formulated.

*Question 1a: If contact were made between humans and extraterrestrial intelligence (ETI) on earth or in the solar system, what is the most probable means by which that would occur and how would we know that the interaction had taken place?*

### **To the first part (probable means of contact):**

Let's face it:

The ambassador from Venus could land a spacecraft on the White House lawn at high noon, announce her identity, encourage us all in a worldwide broadcast in every native language, to work for peace — and it would all be soon forgotten. In less than a generation, the event would be a faded myth, like an old movie languishing in a Hollywood vault. Just another historical event.

Let an invading horde from Zeta Reticuli lay waste to half the planet with their death rays, and in less than two generations the anthill will have been rebuilt, our own defensive weapons improved, the next invasion prepared for. Life goes on. Just another historical event.

If it has anything to do with love or war, in other words — extraterrestrial contact cannot be distinguished from anything else that goes on in our world. We have our own prophets telling us not to kill one another, and we have our own death rays aimed at one another, and none of that appears likely to change any time soon.

By and large, the popular perception of extraterrestrial contact must fall into the category of the wretchedly ordinary, with all that implies: some drama, some entertainment, some pain and sadness, some discovery and rediscovery, some hope, some despair. That's what we make the movies about.

If extraterrestrials were very much different from us, they wouldn't care about such things — and if they were very much like us, we wouldn't care about them nor believe in them, any more than we apparently believe in ourselves. Only a hundred years ago, an Englishman would regard a Hottentot as a strange and alien creature and perhaps some still do, but there's

enough mutual recognition then and now of our common humanities, that any interaction — pleasant or unpleasant — is that between brothers, not between foreign species.

What reason, then, would one have to believe that contact with extraterrestrial intelligence, if that intelligence is anthropomorphic, would differ very much from the kind of contact we experience with one another?

We love, hate or fear extraterrestrial contact because we love, hate and fear one another.

So what meaning is conveyed in such contact which isn't realized in any ordinary earthly contact between people from "different worlds?"

The question hangs on whether these hypothetical extraterrestrials are of our species<sup>1</sup> or not:

If they are of our species, contact has no more potential for recognizability as a distinct event, than does contact among ourselves, culturally or individually. There would in fact be no way in principle to distinguish such contact — it could be an "invisible" part of our history over millennia. In the scientific world, Sir Fred Hoyle's and Chandra Wickramasinghe's hypothesis of panspermia<sup>2</sup> accelerating our evolution, would qualify as such contact. And while such an hypothesis could have involved just a singular event in the past, nothing theoretically bars it from being a continuously repeated process. In either case, however, in empirical terms, the contact will show up as compatible with conventional evolutionary theory — random mutation and natural selection. Parsimony of explanation will favor Darwinian evolution, absent of evidence for the alternative.

Even if such extraterrestrials announced their identity, there would hardly be a credible way for them to prove their origin, and what would be the point anyway? So subtly would our reality be entwined with theirs, there would hardly be a reason to differentiate us and them. If panspermia proves to be true, if some "extraterrestrial gene" marker is discovered, it will only show that there is something uniquely human about us, but not that our race originated somewhere else in the cosmos — because in fact there is no "somewhere else" in either cosmology or evolutionary biology. The universe — and the biological life native to this planet — are each all of one kind. Distinctions are arbitrary. Deeply, this is what the Hoyle/Wickramasinghe hypothesis is telling us anyway — that we are already a part of everything "out there," and always have been, and that includes any hypothetical little green men. And women. And androgynes.

The guiding principle of modern science is a belief in an ordered unity,<sup>3</sup> and it has been remarkably effective so far in informing us of a common origin for all phenomena. Did life, then, have to evolve everywhere in the universe as we experience it on our planet? Well, what does one mean by "life" anyway? The galaxies and stars and even space-time itself originated theoretically in a common point. Can one extrapolate from that, that biological life had to evolve on every planet in the same way that we observe it on earth? — no, of course not. Protoplasm is subtle and fleeting and continually mutating, and it is a dynamic system sensitively dependent on a great many variables to make it what it is, going all the way back to what made earth's environment suitable to such life — including the fundamental presence of water, the ability of the earth to regulate its temperature within a narrow range, suitable distance from the sun, etc. The parameters of biology in the larger sense are also extremely subtle, with their environmental and chemical feedback loops and subsystems themselves sensitively dependent on initial conditions, rendering evolutionary predictions difficult or impossible.

But considering the great many stars in the observable universe, it seems statistically likely — as luminaries such as Carl Sagan and Frank Drake have insisted — that some percentage of solar systems “out there” provided the conditions for the evolution of biology as we know it, in principle if not in morphological form. And from there the extrapolation is easily and reasonably made that they would be as curious about us, as we are about them. After all, the exploratory instinct is tantamount to survival itself, in evolutionary terms, as the fitness landscape passes through cycles theoretically natural to self-organized critical (SOC) systems<sup>4</sup> that may signify an extinction event for particular species, including our own.

Assume, then, that the inevitabilities of SOC systems — predictable in the long range though not for particular events — bring everything formerly thought to be “out there” to within what is broadly “here.” That is, that the universe is an SOC system. Then the definition of “extraterrestrial intelligence” has no strong meaning, no meaning which implies that any contact between “them” and “us” would differ qualitatively from contact between “us” and “us.” By this assumption, then — any reasonable hypothesis about the form of contact which involves *our own cultural history* cannot be rejected out of hand. That is what we meant by our reference to “invisible” contact before. Another long-recognized guiding principle of science is “The absence of evidence is not evidence of absence.”<sup>5</sup> Along with Newton’s highly-regarded injunction to “make no hypothesis,” we already have scientifically valid criteria to seek evidence of contact in the very “ordinary” sphere of our human experience:

Myths, dreams, legends, contactee stories — these are in fact already as “alien” to our everyday experience as one can get and still be within the range of comprehensibility.

Are these experiences real? Are they true?

By what criteria would one show that they are not real, and not true?

One of the best kept secrets of science, in fact, is that scientific method does not care about “reality” and “truth.” These are from the language of religion and philosophy, not science.

What science is concerned with, are means of deducing facts. But even what qualifies as a “fact” bears analysis. The better term is the technical one: data. Outside of its many applied usages in computer science, the term is meaningless — unless given the context of a theory. For example, there exists a cosmic background radiation of a temperature about 2.7°K. That’s a measured quantity on the Kelvin scale, which is an absolute scale of temperature, i.e., starting from a (theoretically unobtainable) point where temperature itself cannot exist. By itself, this datum has no meaning. The important thing, scientifically, is that it can be deduced from the Big Bang theory. It really doesn’t matter that the theory preceded the data discovery (Penzias and Mitchell, 1965), or whether the physical discovery might have preceded the inception of the theory — these are only quirks of history. That the data have a context for interpretation, a theory, gives them the status of “fact,” and renders competing theories suspect. As a matter of record, the Hoyle theory of a steady state universe held about equal status with the Big Bang theory, before the discovery of the background radiation. But since the steady state theory cannot account for the background radiation (it is not consistent with the matter accretion process that steady state predicts), and BB can (the radiation represents the dying embers of the hypothetical big bang event) — one can see how data drives scientific analysis. It “kills off” incomplete or incorrect theories, and promotes those theories not falsified by the data.

But a theory — a model of reality — is as close as science can come to the essence of reality. We have trained ourselves to think that the stronger a theory is supported in evidence, i.e. the theory being falsifiable but unfalsified through many trials, the more “real” the theory is, the more “truth” it contains. Yet it really is only as strong as the next set of falsifying data. A scientific theory is as delicate and contingent as life itself. But if it is well supported in evidence — as persistent as life itself.

**To the second part (how would we know an interaction had taken place?):**

In the final analysis, there is but one kind of event which unambiguously evidences true contact:

A close encounter of the fourth kind — abduction.

But even this is not good enough unless accompanied by witnesses to the abduction, the return of the abductee by the abductors, and verification *by the abductors*, of the events in question.

The news and the UFO literature is full of stories from people who claim to have been abducted and lived to tell about it. So numerous and well known are these, that it is not worth listing an inventory to support the point. And strangely, not a trace of unambiguous physical evidence is left from such alleged encounters. Because of this, the accounts are generally explained away as some form of hysteria, and if the accounts are supported by two or more people — then it becomes shared hysteria or mass hysteria. Apparent surgical scars and radiation burns can be discounted, because after all, there are a lot of mysterious phenomena in the medical literature and in psychiatry. If one believed that aliens were behind such things, one might as well believe that angels and demons interfere with our course of history as well. And we all know that angels and demons don’t exist — don’t we? — we know that mythological phenomena attributed to them can be explained rationally and demonstrated under replicable conditions.

There’s the rub.

Personal accounts can’t be audited. One cannot independently replicate the conditions of an abduction ...

Unless the abductor wants you to.

What is striking about most of these cases is that the abductees, like rape victims, not only have apparently nothing to personally gain by going public with their stories — but they are terrified, traumatized. Whatever one believes about the source of the trauma, it is real. But well — aren’t hallucinations real to victims of psychiatric diseases and conditions? Yes — but aren’t such mental conditions generally progressive? Can they appear spontaneously and suddenly in people with no apparent history? Perhaps they can, one would say, and perhaps they do — and in the scientific sense, it really doesn’t matter anyway, because singular events are not analytical.

The abductor must cooperate.

But this is a silly expectation, isn’t it? As silly as asking a rapist to come forward and confess, or asking a Dr. Frankenstein to reveal himself. One can ask, but the criminal has no rational reason to respond, and every reason not to.

One who doubts that such crimes thrive on anonymity need only recall the lessons of this very century taught to us by the Nazis. One need recall how chillingly ordinary were the Nazi drones who went about their hideous medical experiments unhindered by conscience or regret. One need recall that a human being reduced to a piece of meat has no more meaning to the assailant than does the side of beef under a butcher's cleaver. And then — and most important — one need accept, no matter how sick and repulsed he may be by the thought of it, that these drones are part of *our* culture, that *we* created them. They are *us*. Day in and day out, still, we inflict unspeakable horrors on one another, both privately and officially, in the name of some god or devil or ideology — or hell, just because we want to and can get away with it.

Would it be less reasonable to expect that an “alien” intelligence of our species would be more benign? Why? Consider that if these “aliens” really do understand how this human culture operates, seeing what we do to one another, why would they not think that an abduction here and there for their own purposes would be permitted — but only under the cloak of anonymity or official sanction? Isn't that the way the rules work? Don't we condone and even promote such things? Of course we do!

It really doesn't make much difference if the CIA or the Illuminati ... or Aliens ... is behind the alleged UFO abductions. If the abductor has the technological means to carry out these nefarious violations undetected, he will do so as long as we as a culture of human beings tacitly approve.

And if we don't approve? The demonstration of this is not in law, but in behavior.

Prominent in UFO mythology is the image of a Savior, an extraterrestrial Christ-like figure whose very deific presence fills us with the milk of human kindness and love for one another.

Real experience informs us, however, that such “grace” grows from needs stimulated by evolutionary biology to protect and perpetuate the family, band, clan, tribe, nation. Obviously, though, this same limited altruism threatens global survival. Today, we are caught in a worldwide conflict between our biological drives and our intellect. Journalist Howard Blum's survey of the UFO phenomenon, *Out There*<sup>6</sup>, included a modified version of the Drake equation, weighing the probability of a civilization destroying itself with its technology before making contact with another civilization. The conflict between technology and survival is complex, each both rewarding and threatening the other.

And this is the point where we ought to examine what we mean by “intelligence,” extraterrestrial or otherwise.

Clifford Pickover's imaginative and immensely entertaining book, *Alien I.Q. Test*<sup>7</sup> assumes what IQ tests have always assumed: intelligence is measured by one's ability to solve puzzles that someone has already solved, or to create puzzles to which one already has the answer (or knows in principle how to get it, or knows that it cannot in principle be gotten).

But no theory of general intelligence really exists.

We may speak of intelligent life both here and “there,” for whatever we mean by it — but the test for that intelligence is really in behavior. By observing behavior under controlled conditions, we determine by standards we have chosen beforehand whether that behavior meets our test for intelligence. There would be no point in designing a puzzle that no one knew was a puzzle, and no criteria by which it could be said to even *be* “designed” — but the universe itself is just such an object.

If intelligence hinges simply on the unqualified term “knowing,” there will in fact be no way to ever arrive at a scientific theory of general intelligence — because knowing has many ways and forms, not all of them compatible with scientific method.

To illustrate this, consider that quantum theory allows in no uncertain terms that the universe is in some sense conscious. It is an unambiguously deduced fact following from quantum principles of observer entanglement with the wave function.<sup>8</sup> This obviously has deep philosophical implications — but of what use is it in either the formalisms of quantum mechanics, or in quantum measurement criteria and results? The fact exists metaphysically, but quantitatively, it is null.

One simply cannot determine whether any behavior — of even the smallest particle in the universe, if such a particle exists — is conscious or not, by observing its behavior. (9) Obviously if there is an algorithm for randomization, it is not truly random. But the universe may be its own algorithm.

And why are we taking pains with all this talk of consciousness and intelligence? Simply to make the point, and to make clear some definitions:

It is *we* who deem earth to be a particular “place” and therefore when we speak of “extraterrestrial intelligence” we make the unspoken assumption that either intelligence exists here and nowhere else, or that intelligence exists here and somewhere else — but not that intelligence is a property of the whole universe.

Arch-reductionist Murray Gell-Mann<sup>10</sup> in *The Quark and the Jaguar*<sup>11</sup> is scornful of those who insist that “something else” is required to produce “something.”<sup>12</sup>

Likewise, what reason other than our biases about what constitutes intelligence — for which a general theory doesn’t even exist, and what constitutes the “here” and “there” — when we know that nonlocality is a necessary and verified component of quantum theory,<sup>13</sup> leads us to believe that ETIs dance to our tune, that they obey our ideas or standards of intelligence or that they consider this planet earth to be of any separate or special significance from the rest of the universe?

How do we know that the universe itself does not “think” and that so-called ETIs think with it?

What we don’t know about *ourselves* is enough to project onto an ETI, to model a “something else” that directs and/or interferes with our history. But this externalization of the mystery may be — when put aside what we *do* know about matter and its properties, the same matter of which our bodies and minds are composed — a mere illusion. Gell-Mann’s “nothing else required” extrapolates to the whole timeless universe. Our models are space-like, not time-like.

But then, again — any phenomena which manifested from this self-referencing world would be unlikely to be distinguishable, in a scientific sense, from that which we know to originate in the terrestrial sphere.

Intelligent life?

In the strictest sense, our search is not for intelligent life, but for help with the hard problems of existence and survival.

Hence, the fear of being exploited and betrayed by the more intelligent life, as we betray and exploit the less intelligent life in our own ecosphere. We hope they will be kind, while we know

that with their superior intelligence and technology, they do not *have* to be. In a system where life feeds on life<sup>14</sup> if the feeders are humane, they are humane only to the extent that they can afford to be. That is, humanity is an afterthought — tied to the knowledge that the system can be depleted faster than it refreshes itself, and one can easily relate this to an evolutionary benefit.

So we have a very difficult time identifying intelligence with other than exploitation. It is of no apparent evolutionary benefit to define it otherwise. The intelligent creature is the one with the most ability to exploit his environment, and thus the identification of intelligence with puzzle solving, which is to say — model building.

In scientific terms, models are externalizations — objectifications, idealizations — of the way we think things work. Models are as much “reality” as science allows or can stand.<sup>15</sup> One should not expect any scientific model of ETI contact to break this barrier, to somehow become more “real” than anything else in the canon of science.

But in fact, this is the very expectation we harbor by speaking of contact with “intelligence” in the first place. An ETI is assumed to be superior for its advanced technology, implying superior puzzle solving ability — which also implies a deeper desire to exploit, which is something beyond scientific modeling.

The ways in which we have proposed contact — imply that we want to give the ETI an I.Q. test of our own.

But if, as Leon Lederman finds it necessary to ask, “What is the question?”<sup>16</sup> — there is no puzzle, but only one dynamic and ultimate model — one is left to propose testing the I.Q. of the entire universe. That is silly and outrageous, only because the notion of general intelligence is a silly notion in the first place.

There is no intelligence — there is only intelligent *behavior*, and the choice of which behavior is intelligent is an arbitrary one, defined by arbitrary standards.

And they are our standards, not necessarily those of the hypothetical ETI.

Perhaps they might look on our efforts — broadcasting signals, erecting elaborate receivers for signals — like we sophisticated Westerners view the “cargo cult” of the primitive Pacific Islanders. Has anyone ever felt the need to reward those actions?

If one really believes that an ETI respects scientific method, and judges intelligence by certain standards of behavior in approximately the same way as we do — the attempted exchange of signals would be far too feeble an indicator of that intelligence. After all, we attempt communication with animals, but there is little indication that there is a mutual exchange. In fact, even if an ETI were now attempting such communication with us, there is no guarantee that we have the capacity to recognize the pattern or to recognize that there even *is* a pattern.

So to the point of what form of contact is most probable:

Silent observation. (By *both* parties, I mean — which is better explained in the Research part of this essay.)

And to the point of how we will know it has taken place:

When they figure out how to tell us. Or we figure out how to tell them.

If there are ETIs abducting and exploiting us for biological study, there is no reason for them to reveal themselves, if they can help it, and we shouldn't expect them to. No more than we would do in the same circumstances.

If there are ETIs who are interested in our evolutionary development, with the expectation of communicating with us — then we ourselves have to be more concerned with our evolutionary development, if we have a like expectation.

The primary goals would be self-sufficiency, and improved quality of life:

To extend President Kennedy's famed statement, we would "ask not what our universe can do for us, but what we can do for our universe."

Would it not be reasonable to assume that an intelligence of our species with an advanced technology — observing that we overpopulate, pollute and kill each other both randomly and by official sanction — would reasonably conclude that we are not even worth contacting? What, after all, would be the point of such contact? It seems their primary concern would be that we are contained — like a threatening infection — until such time as an extinction event, caused either by the inevitable course of events in a self-organizing system or by the terminal nature of our own disease — renders the planet and therefore the universe free of infection once again. Perhaps they hope that such events will lead us to mutate and evolve into a less harmful form. Perhaps they even have genetic means to aid such evolution, and perhaps that is what the abductions — if they are really happening — are all about.

Regardless, though, if this probable view of us is held by an extra-terrestrial intelligence — it would preclude the probability of communication between them and us.

Let's look at it in terms of religious mythology:

All gods say "be good," but religious adherents interpret that good as the good of family, clan, band, tribe, nation. We can see that this is true, even when the principles of any particular religion are promoted as being universal.

But one would protest — what about those individuals who do earnestly practice the virtues of forbearance and therefore serve the universal good?

Unfortunately, perhaps, but truly — they make no difference, from the perspective of an objective observer looking for positive evidence of cooperative behavior. This is because that behavior is not measured in individual acts, or forbearance from acts, but in statistical terms. To an observer for whom the universe is a body united, it must seem horrifying indeed that part of our world lives in plenty and part of it subsists in famine, when humans are all of a species. This racism cannot be regarded as other than a disease to be quarantined. One cannot look at a world in this state and say that on the average the world is reasonably prosperous, any more than one can say that a person who stands with one foot in the fire and the other in a bucket of ice will — on the average — be at a comfortable temperature.

Would a reasonable person think that this is the kind of world with whom an ETI would want to partner — for any reason at all? Would there be any "race" on earth worthy of such partnership in exclusion to any other "race?" The idea is foolish to anyone but a racist, but it is equally foolish to think an ETI would make such a distinction among "races."

Hence, it is no wonder that conceptions of ETIs generally fall either to the fear of a superior intelligence who would dispassionately exploit us for their own ends, or a Savior who would try to rescue us from ourselves — but not in between.

Contact would be less problematical if there were an "in-between" answer, however.

And unfortunately, it is precisely the "in-between" assumption that drives most present government research for ETI. The State obviously has a selfish interest, in wanting to secure and

exploit the technology that permits interstellar travel. So it is probably inevitable, if even wishful thinking, that those who fund such efforts would assume that our “space brothers” are eager to communicate with us.

But there’s no real logic behind this assumption. A humanoid race with the capacity for interstellar travel — allowing that they are not of the aforementioned exploitative/research bent who view us as lab animals — have every reason to observe silently, possibly with the motive of keeping our destructive ambitions in check before they can spread. Which would certainly obviate their sharing any technology.

Assume for the sake of argument, too, that both varieties of human-like ETIs actually exist. Wouldn’t one think that the benevolent kind — hypothetically concerned with our evolution to an acceptable standard of cooperative membership in “the brotherhood” — would be at war with the malevolent (or more accurately, the disinterested, exploitative) kind? After all, this latter variety of hypothetical ETI would seem to be precisely the kind of Frankenstein’s Monster that the former variety would be trying to contain — and since they are obviously not contained, any reason for our being “quarantined” would be obviated. We ourselves would be just another variety of malevolent Intelligence, presently less harmful only for the reason that we have as yet only primitive means of space travel.

One would be led to think, then, that

1. There aren’t any ETIs sympathetic to us, no gods swooping down to rescue Lot while they destroy Sodom, *or*
2. Individual ETIs exhibit the entire range of ethics seen in human beings, and so differ not at all from us in that respect, *or*
3. Reports of abductions (allowing that they are real as opposed to psychological events), interpreting malevolence, are really the result of a panic response similar to that of animals caught in the traps of human beings who mean to do them good rather than harm. In other words, we have been contacted and lack the advanced intelligence to realize it.

To another option entirely:

The hypothetical extraterrestrials are not remotely related to our species.

In this case, we might look to them as fungi look relatively to us. Somewhere on this planet, someone might be interested in communicating with fungi, but it is unlikely and the chances for success under present knowledge look remote.

If there is any hope of communicating with an assumed ETI, it requires that the species shares some basic characteristics with our species:

- a. Language concepts and structure, both conceptually and physically.
- b. Exploratory instincts (which, along with their advanced technology, would have brought them near enough to make communication possible).
- c. Empathy with like forms, such as that which motivated us to seek contact.
- d. Similar genetic markers.

**We shall use these criteria to answer question 1b:**

*1B. Please design one particular research project or a whole set of research projects that focus on how to detect or verify the presence of ETI. The research design should be both scientifically rigorous and innovative. Implied in this question is a further question: What are the acceptable levels of proof required by science and society for the existence of ETI on Earth or in the solar system?*

It seems entirely reasonable by the previous discussion, that we already have in place the basic research foundations — spread over several disciplines — for detecting and communicating with an hypothetical ETI. What is lacking is theoretical structure. My recommendation involves three phases. Phase I would be to fund pure research, i.e. theory development, in the following named fields. Phase II would be to collect and evaluate this theoretical work through an agency (possibly the Institute for Discovery Science itself, if that is consistent with its mission). Phase III would be to fund experiments for the most promising theories, on the criteria of simplicity, efficiency, and tractability within current knowledge and technology.

The disciplines targeted for theoretical development:

**1. Language Analysis**

I once posed a question to a group of fellow researchers in an online chat: “What new philosophical tools have been developed in the past 100 years?” (It was admittedly a smug, baiting, question, since I consider myself an antiphilosopher and was trying to make the point that philosophy as presently constituted is not progressive.) There was but one noncommittal reply, something to the effect: “I was going to suggest the digital computer, but I think it may be outside your criteria.” I had to admit with some embarrassment that I had privately considered my criteria absolute, and that his answer showed me wrong.

Indeed, the digital computer facilitates an immense range of possibilities for theoretical development in language, since it provides the means to test language theories. I do not know which agency might best spearhead the research program — but I would personally favor one with a heavy emphasis on Artificial Intelligence (AI), along with linguistic research. I have no citations available, but I think that linguists have pretty conclusively shown that humankind possesses but one language with a multitude of dialects. A theory of ETI languages would necessarily have to consider a set of all possible languages in the context of a rigorous definition, or definitions, of “intelligence.” We presently have no general theory of such, and it appears unlikely that such a general theory is possible, for other theoretical/logical reasons.

I will anticipate and answer one objection to this whole direction:

One might say that it is totally unnecessary, since mathematics is a universally precise language, and that symbolic logic has to follow the same rules everywhere in the universe. Indeed — this is the very prejudice demonstrated in current searches for ETI, that an understanding, e.g., of the expansion of pi, or knowing the value of the golden section phi, is requisite to an Intelligence with enough ability to speak to us from across the vast reaches of the cosmos.

I will stand firm against this all -too-pervasive anthropomorphic and Platonic viewpoint.

There is no particular reason for our mathematics to extrapolate universally. We freely choose the axioms and construct the theories. Consider the relatively new mathematically-related field of Chaos. (17) A lot of what is deduced from a sensitive dependence on initial conditions, appears to be just how nature works. There is demonstrated correspondence between apparently random pattern formation (e.g., clouds, global weather, economics, population dynamics) and the starting point at which one chooses to analyze such phenomena. Visionaries such as Benoit Mandelbrot and Mitchell Feigenbaum managed to fit a mathematical language which approximates such phenomena to remarkable accuracy — but there is no reason to assume that the mathematics preexisted the phenomena. The same goes for the new science of self-organized criticality. (18) It models nature, but there is no evidence that nature is modeled *by* it.

So if one would object, that either

- a. Our known theories in the mathematical canon are necessarily known to ETI, and deemed significant, I would respond that there is no way, in principle, to know that our abstractions are generalizable to the universe, or that our whole system of mathematics is not a deduction from a more unified theory of mathematics in which such values as pi or phi are so trivial as to go unnoticed as “background” noise in the language of nature, and not intelligent output.

*Or*

- b. That machine language is programmed on conventional mathematical principles anyway — so that the output analysis is tautological — I would respond that AI has advanced even now so far as to mimic elementary “intuitional” thinking (consider the success, however limited, of IBM’s “Deep Blue”), that one can have a reasonable expectation that advanced artificial language might in fact be equivalent to AI. That is, that the ability to “hide” logic, suppress it in favor of success at the task (particularly a competitive task) in a holistic sense, is an evolutionary advantage, and that some artificial languages might theoretically be demonstrated to possess a greater evolutionary advantage than others.

So all in all, I consider the language analysis research program the most important. If we do not know the terms on which we are most likely to communicate with ETI, we are simply trusting that we will find this common ground by accident. Possibly we could do so by accident, but it would seem more reasonable to narrow the probabilities.

## **2. Genetics/evolutionary history**

The Human Genome Project, through the National Human Genome Research Institute (NHGRI) is throwing a lot of money behind completing DNA sequencing in the human genome.<sup>19</sup>

Along with the completion of this important work, lies the possibility of formulating a theory to account for critical bifurcations in human evolutionary history (no doubt which, some theories already exist for which I have at present no available citations) — to build testable hypotheses of whether a particular critical bifurcation is entirely consistent with terrestrial

evolution, or supports extraterrestrial origin in accordance with a theory of such. This would elevate panspermia to a more serious level of research.

The NHGRI seems the qualified agency to evaluate such theories and research.

### **3. Evidence from social and cultural history/mythology.**

There are, of course, already volumes of speculation about the hypothetical results of hypothetical interaction of “aliens” with humankind. But these to my knowledge lack serious theoretical grounding. If they are to be taken seriously, testable hypotheses must be formulated.

### **4. Space Research**

This is more or less obvious, and NASA (and its counterparts in other countries) is more or less the logical agency to conduct the research.

But I would say that the research emphasis should go — not to our proven conventional means of visiting the moon and nearby planets (“been there, done that”) — but to artificial gravity and inertial propulsion systems (which two areas are theoretically identical). Deeper and more unifying theories on the origin of gravity and inertia are required here. The reason: if we do not theoretically possess the mechanical means to propel ourselves in a reasonable time across four-dimensional spacetime to the nearest stellar bodies — then we and any other corporeal Intelligent Life (allowing that they got within relatively immediate signalling distance and that they are corporeal) must have means of interdimensional travel that obviates two-dimensional distance between points, analogous to a quantum jump on the macroscopic scale. This sounds like science fiction, but so would today’s technology a hundred years ago. Again — what this research requires is a viable theory.

### **5. Peace Education**

Considering the political condition of our own country, let alone the world, this could be problematical. Nevertheless, following from the first discussion, of why ETI would even *want* to contact us, I deem this component necessary — possibly, the appropriate agency could be a division of the United Nations.

Is there a “Theory of Peace?” Does it include a testable hypotheses? Has it been tried?

Demonstrably, “politics as usual” will not make us an attractive partner to an ETI, allowing that both we and the ETI are worthy of being partners in the first place.

To the levels of proof” question in the essay requirement:

There is no acceptable level of proof in scientific method. It is an open system. There is only a body of evidence, consistent or inconsistent with theory. That is why this paper emphasizes theory — by which evidence may be interpreted — because standing alone, data mean absolutely nothing.

An acceptable level of proof to society? What society? Some individuals will examine the evidence and be convinced by its weight. Some will examine the evidence and deny it anyway. Some will never examine the evidence at all. It is this way with any scientific theory, no matter

how important. I predict the level of acceptance will fall to a bell curve distribution from “not convinced” to “totally convinced,” with most remaining relatively agnostic.

### Summary

ETI either exists, or not. It will either disclose itself, or not. It is fairly safe to say that if it does exist, and does not want us to have conclusive evidence of its existence, that we won't get it. The mere assumption of ETI technical superiority should be enough to inform us of that. This leaves us with two alternatives:

1. Do nothing.
2. Make ourselves worthy of contacting, and being contacted.

The first alternative is unlikely to happen, anyway. We are a curious species, and that curiosity is no doubt an evolutionary advantage.

As for the second, we have nothing to lose. Either way — whether we find ET or find ourselves — we will be enriched.

### Notes

1. By “species” we merely mean humanoid in the broadest sense, laying aside any technical boundaries of reproduction, etc.
2. Dennett, Daniel C., in *Darwin's Dangerous Idea* (Simon and Schuster 1995) notes (p. 331) that Hoyle's and Wickramasinghe's hypothesis does not oppose Darwinism: “Panspermia, intergalactic gene-splicers, and multiple origins of life on earth are all harmless if unwelcome heretical possibilities.” “Unwelcome,” it is presumed, only for lack of evidence. But one would have to face, if panspermia were evidenced, that our corner of the universe is not “alien” to other forms, if they “seeded” us, nor consequently, we to them.
3. Pagels, Heinz, *The Dreams of Reason* (Simon and Schuster 1988) p. 245: “... the reason for the possibility of scientific knowledge lies ultimately in the nature of the world — the existence of a cosmic code — a reason that cannot be dismissed without also dismissing more than a millenium of scientific investigation and discovery.”
4. Bak, Per. *How Nature Works: The science of self-organized criticality* (Springer-Verlag 1996)
5. The author apologizes for not knowing which wit to attribute this to. It seems from memory, though, to be most popular with astronomers and astrophysicists, for understandable reasons: many effects supported by the theoretical presence of mass “out there” are hard to see, even though theoretically necessary.
6. Bloom, H. *Out There* [Pocket Books 1990]
7. Pickover, C. *Alien I. Q. Test* (Basic Books 1997).
8. Kafatos, M. and Nadeau, R. *The Conscious Universe* (Springer-Verlag 1990) is subtitled *Part and Whole in Modern Physical Theory*, examines the relationship between physical theory and physical reality.
9. Barrow, J. *Pi in the Sky* (Oxford University Press 1992), p. 137: “Even arithmetic contains randomness. Some of its truths can only be ascertained by experimental investigation. Seen in this light, it begins to resemble an experimental science.” If even the behavior of numbers cannot be determined to be nonrandom, how much less can the behavior of material objects?
10. This is not an insult. I consider myself a reductionist, and materialist, as well.
11. Gell-Mann, M. *The Quark and the Jaguar* (W.H. Freeman and Co. 1994).

12. Horgan, J. *The End of Science*, p. 214: "Gell-Mann noted that 'the last refuge of the obscurantists and mystifiers is self awareness, consciousness.' Humans are obviously more intelligent and self-aware than other animals, but they are not qualitatively different." One should note that the thesis presented in this paper is not identical, but close to Gell-Mann's idea, in asserting that behavior is indistinguishable from consciousness in principle.
13. Verified at least in the sense that Bell's Inequality is violated, as shown by the results of Alain Aspect's experiments.
14. I am reminded of an interview some time ago that Bill Moyers conducted with the mythologist Joseph Campbell, in which Campbell asserted something to the effect one could not connect to any metaphysical properties of life on earth until he connected with the "life feeds on life" theme. It was that fundamental.
15. Dozois, G., ed. *The World's Best Science Fiction, fourteenth annual collection*, St. Martin's Griffin 1997, contains a charming and brilliant story by Jim Cowan, "The Spade of Reason," which examines the thoughts and feelings of a mental patient on the day of his release: "... some minds create weird models and those minds may be mad. I don't know about that. But I do know that one kind of madness is not knowing that the model is all we will ever know."
16. Lederman, L. with Teresi, D. *The God Particle: If the Universe is the Answer, What is the Question?* (Delta/Dell 1993).
17. Gleick, J. *Chaos*, (Penguin Books 1987). General discussion.
18. Bak, op. cit.
19. "A planned boost for Genome Sequencing, but the plan is in flux," *Science*, vol 281, no. 5374 (10 July 1998), p. 148