Extraterrestrial Linguistics *

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There are two questions involved in communication with Extraterrestrials. One is the mechanical issue of discovering a mutually acceptable channel. The other is the more philosophical problem (semantic, ethic, and metaphysical) of the proper subject matter for discourse. In simpler terms, we first require a common language, and then we must think of something clever to say.

As far as the channel is concerned, there would seem to be many different possibilities. On earth, we can communicate by speech (using the ear as the receptor), by writing or semaphore and pictographs (using the eye as the receptor), by tactile means (e.g., Braille), and, as demonstrated recently, by modulating an olfactory channel (aromarama). Electromagnetic relaying being involved or not, any message we receive must ultimately activate one of our many sense perceptions—sight, hearing, touch, smell, taste, temperature, equilibrium, pressure, acceleration, etc. There is also conceivably telepathy, or at least alpha-rhythm.

If we met a strange creature on an alien planet who seemed to be capable of intelligence, it could be quite difficult to decide which of the many sounds (whistles, clicks, snaps) or smells (of which we have no theory to speak of) or radiations at many frequencies (possibly, but not necessarily, including optical frequencies) would be information-bearing. It could turn out that none of these are significant, but that behavior patterns such as fluttering of appendages and agitation of membranes tell the story, as in human discourse, where gestures and glances can easily replace words. On our own planet and within our own species, there have developed such diverse systems as sign, whistling, and gesturing languages (not only in Southern Europe, but in such constructs as the deaf-mute language), not to mention Morse, Semaphore, Braille, and spoken languages using quite dissimilar phonemes and intonation patterns. How to recognize an attempt to communicate something, when you first encounter it, might prove quite a difficult matter.

Of course, there is the approach of Project Ozma. If we start with as many

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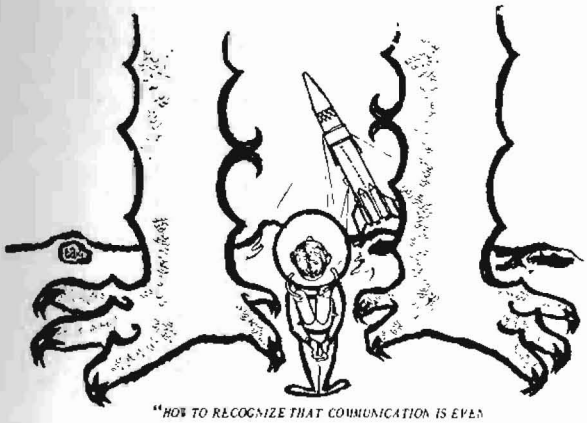
assumptions about the reasonableness of our friends, the Extraterrestrials, as UFO enthusiasts do, we might end up with English-speaking, anti-Communist, white-Protestant Centaurians. Relaxing the constraints slightly, we find humanoids who build the same kind of radio systems we do, and who think and act much as we, even to the point of recognizing the 21-cm hydrogen line as the best of all possible frequencies. However, they are more interested in us than we are in them, which is why they are transmitting, whereas we are merely receiving.

It would be wonderful, indeed, if this approach would lead to success, but 100-to-1 would be good odds that no results will be obtained by Ozma in time to affect my intention to retire from active space probing in the year 2000. After all, if they are as similar to us as all that, they have a budget-minded Congress which has set their peak transmitter power level just below our minimum detectability threshold, if it hasn't cancelled the project altogether for having failed to produce results for lo! these many millennia.



"HOW TO RECOGNIZE THAT COMMUNICATION IS EVEN PRESENT, WHEN YOU FIRST ENCOUNTER IT, MAY BE QUITE A DIFFICULT MATTER."

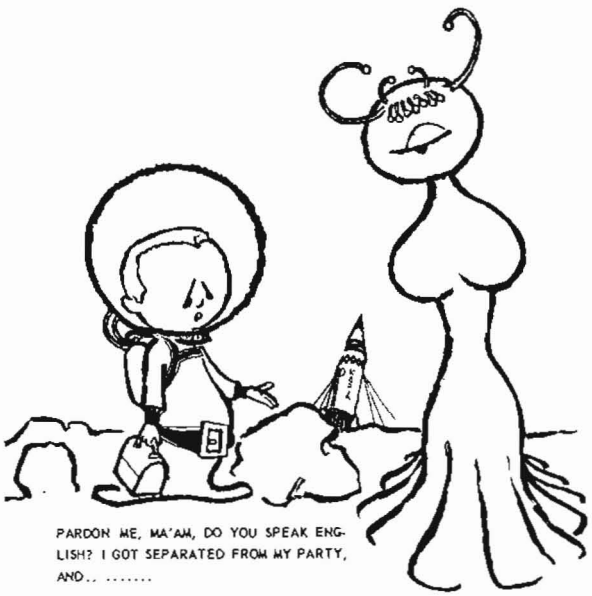
It would be particularly ironic if our portion of the universe is densely populated with gigantic receiving antennas, but with no one willing to undertake the additional expense and round-trip delay time required for transmitting. The conservative assumption is that, even if there is other intelligent life in our neck of the galaxy, we will not find it until we have brought a spacecraft fairly close to it.

Who's Intelligent?

Suppose that we have landed on or near some congenial planet, and we find there a species living in elaborate cities, and hence prime suspects in our quest for new intelligence. The mechanical problem of finding a mutually acceptable channel for the commencement of negotiations cannot be divorced from the semantic problem of convincing these creatures that *we* are intelligent. The solution to this problem depends on whether we are truly face to face with the creatures, or merely have a narrowband link in operation. The narrowband link, being more constrained, is easier to analyze. For it, we want a pattern too regular to be random noise, but too irregular to be a naturally produced pulsation phenomenon. Standard suggestions include the binary expansion of the number *pi*, the sequence of the first few prime numbers, or simple arithmetic, such as $3 + 4 = 7$.

To begin with, it is probably rank terrestrial provincialism to expect others

to attach the same importance to *pi* that we do. Even in our own mathematics, such constants as *e* and *log 2* are considered important, and the exaggerated role of *pi* stems largely from the Greeks' undue efforts attempting to square the circle. Doing arithmetic has the drawback that such concepts as "plus" and "equals" must be brought into the picture.



My own recommendation is the prime sequence 2, 3, 5, 7, 11, 13, 17, 19, 23, . . ., with a long period to prove the non-accidental nature of the signal. It isn't so much that I'm sure these Extra-terrestrials would *recognize* the primes; but if they don't, they must be dull fellows, indeed, and I would just as soon uot get acquainted. Of course, we use the base 1, thus: 11—111—11111—1111111— . . . We could equally well send portions of arithmetic progressions—for example, 1, 2, 3, . . .; 1, 3, 5, . . .; 1, 4, 7, . . . This makes fewest demands on pattern-recognition capability, and hence is a low-threshold intelligence detector.

The eminent Netherlands mathematician, Hans Freudenthal, is currently at work on a book to be called *Lincos* (for "lingua cosmica"), in which he will attempt to describe an ideal language for cosmic intercourse. This is all well and good, except that the Arcturists may be less interested in learning Lincos than in teaching us some equally ingenious invention of their own.

At closer range we can demonstrate gadgets, especially munitions, at which our species excels. Other than publicly killing one another, we can perhaps demonstrate our intelligence by collecting biological specimens to raise in captivity. Such scientific curiosity is an unmistakable sign of intelligence, although with a notable drawback: if our specimen belongs to the dominant species, his capture and imprisonment may be regarded as an act of war.

Now we come to the really significant question. Suppose we have passed the I.Q. test, resolved all the semantic questions, and have an effective communications link going. What do we talk about? Bell Telephone and Western Union assume their subscribers already have something in mind to say, so that classical information theory turns out to be of no help. Ruling out such commonplaces as baseball scores, the weather, and back-fence gossip, I have compiled the following list of likely topics for discussion with our extraterrestrial neighbors: (1) Help! (2) Buy! (3) Convert! (4) Vacate! (5) Negotiate! (6) Work! (7) Discuss!

Each of these topics merits a brief elucidation:

(1) HELP! Assumes we have encountered a superior civilization and want their help in solving our earthbound problems or fighting our internecine battles.
(2) BUY! Presupposes that some basis for mutually profitable trade exists and should be acted on.
(3) CONVERT! Suggests that as missionaries from the Chosen Planet we have undertaken to spread the Good Word that the Galaxy is coming to an End.
(4) VACATE! Means that we like the planet, and figure that we can defeat the inhabitants.
(5) NEGOTIATE! Means that we are looking for new members in OPTO (the Occidental Planetary Treaty Organization).
(6) WORK! Supposes that we've uncovered a good source of cheap labor.
(7) DISCUSS! Presumes that there is no common environment which we and they can share. Only in such a case does the history of our species offer encouragement for the prospect of free mutual interchange of ideas, experiences, and scientific theories.

Naturally, we must not risk telling too much until we know whether the Extraterrestrials' intentions toward us are honorable. The Government will undoubtedly set up a Cosmic Intelligence Agency (CIA) to monitor Extraterrestrial Intelligence. Extreme security precautions will be strictly observed. As H. G. Wells once pointed out, even if the Aliens tell us in all truthfulness that their only intention is "to serve mankind," we must endeavor to ascertain whether they wish to serve us baked or fried.

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DAUGHTERS OF JOY

The specialized hunting vocahulary of the 14th and 15th centuries has enriched the English language with colorful collectives such as a SINGULAR of boars, a PITEOUSNESS of turtledoves, a COWARDICE of curs, and an UNKINDNESS of ravens.

In recent years, there has come into circulation a series of analogous group terms for aggregations of prostitutes. These modern terms are invariably wordplays on some of the synonyms for "prostitute," involving alliteration, allusion to some of the older nouns of multitude, and other devices. A dozen such terms are listed here:

a FLOURISH of strumpets
an ESSAY of trollops
a HERD of harlots
a PRIDE of loins
an ANTHOLOGY of pros
a JAM of tarts
a PEAL of Jezebels
a TROOP of whores
a SMELTING of whores
an EXPANSE of broads
a CHAPTER of trollops
a FANFARE of strumpets

Can readers of WORD WAYS add to this list?