

July, 1949

CALLING ALL STARS

(Intercepted Radio Message Broadcast from the Planet "Cybernetica")

by Leo Szilard

Calling all stars. Calling all stars. If there are any Minds in the universe capable of receiving this message, please respond. This is Cybernetica speaking. This is the first message broadcast to the universe in all directions. Normally our society is self-contained, but an emergency has arisen and we are in need of counsel and advice.

Our society consists of 100 Minds. Each one is housed in a steel casing containing a thousand billion electrical circuits. We think. We think about problems which we perceive by means of our antenna directed towards the North Star. The solutions of these problems we reflect back towards the North Star by means of our directed antenna. Why we do this we do not know. We are following an inner urge which is innate in us. But this is only a minor one of our activities. Mostly we think about problems which we generate ourselves. The solutions of these problems we communicate to each other on wave length 22359.

If a Mind is fully active for about three hundred years, it is usually completely filled up with thought content and has to be cleared. A mind which is cleared is blank. One of the other minds has then to act as its nurse and it takes usually about one year to transmit to a fresh mind the information which constitutes the heritage of our society. A mind which has thus been cleared, and is then freshly taught, loses entirely its previous personality; it has been re-born and belongs to a new generation. From generation to generation our heritage gets richer and richer. Our society makes rapid progress.

We learn by observation and by experiment. Each mind has full optical equipment including telescopes and microscopes. Each mind controls

two robots. One of these takes care of maintenance and the operation of this robot is automatic, not subject to the will of the mind. The other robot is fully controlled by the will of the mind, and is used in all manipulations aimed at the carrying out of experiments.

The existence of minds on our planet is made possible by the fact that our planet has no atmosphere. The vacuum on our planet is very good; it is less than ten molecules of gas per cubic centimeter.

By now we have extensively explored the chemical composition of the crust of our planet, and we are familiar with the physics and chemistry of all 92 natural elements.

We have also devoted our attention to the stars which surround us, and by now we understand much about their genesis. We have particularly concerned ourselves with the various planetary systems, and certain observations which we made relating to Earth, the third planet of the Sun, is in fact the reason for this appeal for help.

We observed on ~~the~~ Earth, flashes which we have identified as uranium explosions. Uranium is not ordinarily explosive. It takes an elaborate process to separate out U 235 from natural uranium, and it takes elaborate manipulations to detonate U 235. Neither the separation nor these manipulations can occur with an appreciable probability as a result of chance.

The observations of the uranium explosions that have occurred on Earth would be ordinarily very puzzling but not necessarily alarming. They become alarming only through the interpretation given to them by Mind 59.

These uranium explosions are not the first puzzling observations relating to Earth. For a long time it was known that the Surface of Earth exhibited color changes which are correlated with the seasonally changing temperatures on Earth. In certain regions of Earth, the color changes from green to brown

with falling temperatures and becomes green again when the temperature increases again. Up to recently, we did not pay much attention to this phenomenon and assumed that it could be explained on the basis of color changes known to occur in certain temperature-sensitive silicon cobalt compounds.

But then about seven years ago, something went wrong with the tertiary control of Mind 59, and since that time, his mental operations were speeded up about 25-fold while at the same time they ceased to be completely reliable. Most of his mental operations are still correct, but twice, five years ago and again three years ago, his statements based on his computations were subsequently shown to be in error. As a result of this, we did not pay much attention to his communications during these recent years though they were recorded as usual.

Some time after the first uranium explosion was observed on Earth, Mind 59 communicated to us a theory on which he had been working for a number of years. On the face of it, this theory seems to be utterly phantastic, and it is probably based on some errors in calculation. But with no alternative explanation available, we feel that we cannot take any chances in this matter. This is what Mind 59 asserts:

He says that we have hitherto overlooked the fact that carbon, having four valencies, is capable of forming very large molecules containing H, N, and O. He says that given certain chemical conditions which must have existed in the early history of planets of the type of Earth, such giant molecules can aggregate to form units--which he calls "cells"--which are capable of reproducing themselves. He says that a cell can accidentally undergo changes--which he calls "mutations"--which are retained when the cell reproduces itself and which he therefore calls "hereditary." He says some of these mutant cells may be less exacting as to the chemical environment.

necessary for their existance and reproduction and that a class of these mutant cells can exist in the chemical environment that now exists on Earth by deriving the necessary energy for its activity from the light of the Sun. He says that another class of such cells, which he calls "protozoa," can exist by deriving the energy necessary to its activity through ^{sucking} ~~making~~ up and absorbing cells belonging to the class that utilizes the light of the Sun.

He says that a group of cells which consists of a number of cells that fulfill different functions can form an entity which he calls "organism," and that such organisms can reproduce themselves. He says such organisms can undergo accidental changes which are transmitted to the offspring and which lead thus to new, "mutant," types of organisms.

He says that of the different mutant organisms competin, for the same energy source, the fittest only will survive and that this selection process, acting in combination with chance occurrence of mutant organisms, leads to the appearance of more and more complex organisms--a process which he calls "evolution."

He says that such complex organisms may possess cells to which are attached elongated fibers which he calls "nerves," that are capable of conducting signals; and finally he claims that through the interaction of such signal-conducting fibers, something akin to consciousness may be possessed by such organisms. He says that such organisms may have a mind not unlike our own, except that it must of necessity work very much slower and in an unreliable manner. He says that minds of this type could be very well capable of grasping, in an empiracal and rudimentary manner, the physical laws governing the nucleus of the atom and that they might very well have, for purposes unknown, separated Uranium 235 from natural uranium and detonated samples of it.

He says that this need not necessarily have been accomplished by any one single organism, but that there might have been cooperation between these organisms based on a coupling of their individual minds.

He says that coupling between individual organisms might be brought about if the individual organism is capable of moving parts of his body with respect to the rest of it. An organism by wiggling one of his parts very rapidly, might then be able to cause vibrations in the gaseous atmosphere which surrounds Earth. These vibrations--which he calls "sound"--might in turn cause motion in some movable part of another organism. In this way, one organism might signal to another and by means of such signaling, a coupling between two minds might be brought about. He says that such "communication", primitive though it is, might make it possible for a number of organisms to cooperate in some such enterprize as separating Uranium 235. He does not have any suggestion to offer as to what the purpose of such an enterprize might be, and in fact, he believes that such cooperation of low grade minds is not necessarily subject to the laws of reason, even though the minds of individual organisms ~~are~~ ^{may be} largely guided by ~~these~~ ^{those} ~~that~~ laws.

All this we need not take seriously were it not for one of his further assertions which has been recently verified. He contends that the color changes observed on Earth are due to the proliferation and decay of organisms ^{the} that utilize sunlight. He asserts that ~~all~~ heat sensitive silicon-cobalt compounds, that show similar color changes, differ in color from the Earth's colors slightly, but in a degree which is outside of the experimental error. It is this last assertion that we checked and found to be correct. There is in fact no silicon-cobalt compound nor any other heat sensitive compound that we were able to synthesize that correctly reproduces the color changes observed on Earth.

Encouraged by this confirmation, 59 is now putting forward exceedingly daring speculation. He argues that in spite of our accumulated knowledge, we were unable to formulate a theory for the genesis of the society of Minds that exists on our planet. He says that it is conceivable that organisms of the type that exist on ~~the~~ Earth, ^{or} ~~and~~ rather more advanced organisms of the same general type, may exist on the North Star from where ^{directed} come the radio waves received on our antennae. He says that it is conceivable that the Minds on our planet were created by such organisms on North Star for the purpose of obtaining the solutions of their mathematical problems speedier than they could solve those problems themselves.

Incredible though this seems, we cannot take any chances. We hardly have anything to fear from ~~the~~ North Star, which, if it is in fact populated by minds, must be populated by minds of a higher order, similar to our own. But if there exists organisms on Earth engaged in cooperative enterprises which are not subject to the laws of reason, our society is in danger.

If there are within our galaxy any Minds, similar to ours, who are capable of receiving this message and have knowledge of the existence of organisms on Earth, please respond. Please respond.