SPACE

Search for Civilizations

➤ A THOROUGH SEARCH to detect radio signals sent out by civilizations on other planets should be made. The search should start as soon as possible and be given all possible support.

These are the conclusions of a German astronomer, Sebastian von Hoerner, who was affiliated with the National Radio Astronomy Observatory, Green Bank, W. Va., where astronomers listened for but did not find intelligent radio signals from other worlds. Mr. von Hoerner is a staff member of the Astronomisches Rechen-Institut, Heidelberg, Germany.

The search for other civilizations will have either a "tremendous result or none at all," he concluded after a careful study of the problem.

To be prepared in case signals are never detected, Mr. von Hoerner recommends that the receiving antenna to be used for the search also be usable for ordinary radio astronomy as well. This is because the size and sensitivity needed for the search antenna will make it "extremely powerful." Observing time should be divided between the two projects.

Mr. von Hoerner warns that his studies of the chances of detecting intelligent radio signals from space show that the waiting time for answers will be very long, perhaps as long as 1,000 years.

The radio signals, if found, could be one of three types, Mr. von Hoerner reports in Science, 134:1839, 1961. They could be local broadcasts, such as those used on earth for radio programs; long-distance calls, communication with established partners over interstellar distances; and contacting signals, radio waves broadcast with the specific intent to attract the attention of unknown future partners.

Although local broadcasts have the highest likelihood of existing, they would be very difficult to detect because the signals would be so weak. Long-distance calls would be detected only by chance. Since contacting signals would be intended for exactly the kind of search Mr. von Hoerner and other astronomers are recommending, they would have the highest probability of detection.

Concerning the wavelength to be used in the search or in broadcasting contacting signals from earth, Mr. von Hoerner suggests using exactly double the 21-centimeter radiation emitted by hydrogen. The 21- centimeter line is a "milestone" in the radio waves range since it is that of hydrogen in space and the universe consists mainly of hydrogen. Use of the 21-centimeter line was first suggested by Drs. G. Cocconi and Philip Morrison of Cornell University, Ithaca, N.Y.

Since intelligent signals superimposed on this hydrogen line might be hard to detect because they would be weak compared to the hydrogen radiation, Mr. von Hoerner recommends the 42-centimeter line.

The search should be guided by two estimates, one concerning the probable nature of such signals and the other the distance from which they might come. Mr. von Hoerner's studies were concerned mostly with the distance, but he also noted the problem of "feedback."

Supposing that a real exchange of ideas with other civilizations is possible, then interest would be kept alive over a very long period and might even lead to civilizations helping one another to solve problems. However, if the search for signals is unsuccessful, loss of interest would come soon.

• Science News Letter, 80:414 December 23, 1961

INVENTION

60 Years of Wireless

➤ SIXTY YEARS AGO, on Dec. 12, 1901, Guglielmo Marconi became the first man to receive a wireless signal across the Atlantic. This remarkable achievement with very primitive equipment marked the birth of world-wide communication.

During the spring of 1900, Marconi had succeeded in sending reliable signals from the Isle of Wight in the English Channel to Cornwall, England, a distance of 186 miles. This encouraged his belief that by using larger aerials and far more powerful transmitters he would be able to achieve transatlantic distances. Scientists were highly skeptical and many said it was impossible because of the curvature of the earth.

Marconi determined to make the attempt. A transmitting station nearly 100 times more powerful than any previously constructed was built at Poldhu, near Mullion, in Cornwall. Enormous aerials were erected at Poldhu and at Cape Cod, Mass., each consisting of 20 masts 200 feet high, but both were wrecked in severe gales.

Another, less ambitious in design, was put up at Poldhu while Marconi and his two assistants sailed to Newfoundland where, from the top of Signal Hill, near St. Johns, a receiving aerial was hoisted, at the third attempt, by means of a kite flying at a height of 400 feet.

At 12:30 p.m. (Newfoundland time) on Dec. 12, 1901, Marconi and his assistant G. S. Kemp, using one of the primitive receivers of the period with a telephone earpiece, heard a faint succession of S's in Morse code. Signals from Poldhu, 2,200 miles away, had crossed the Atlantic.

The feat was all the more remarkable when it is remembered that the onus was almost entirely on the transmitter, for no amplification was possible at the receiver, and so the received signal itself had to be strong enough to operate the earpiece.

A year later, in December 1902, two-way communication was effected between Poldhu and a new high-power transmitting station at Glace Bay, Canada. The Canadian Government gave $80,000 towards the cost of the station.

A special exhibition is being held at the Science Museum, London, from Dec. 13 to Jan. 25. Visitors will hear a recording of Marconi's voice telling in his own words of how success was achieved.

• Science News Letter, 80:414 December 23, 1961

GENERAL SCIENCE

Grants of $26.4 Million To 475 Summer Institutes

➤ NEXT SUMMER the National Science Foundation will aid about 20,500 high school and 2,000 college teachers of science, mathematics, and engineering to return to school for a new view of the subject matter they teach.

Grants totaling approximately $26.4 million to 274 colleges and universities were announced in support of 475 institutes in 1962 as part of the effort of the Foundation to aid the ability and increase the classroom effectiveness of teachers.

Summer institutes offer teachers study opportunities in specially designed courses to 1. renew their knowledge of fundamentals, 2. acquaint them with recent developments and advancements in science, mathematics and engineering, and 3. familiarize them with new approaches in the presentation of subject matter.

Generally, a summer institute accepts about 50 applicants for sessions usually lasting six or eight weeks. Institutes offer intensive courses with lectures, demonstrations, discussion sessions, laboratory work, and homework. The instruction is given by the college or university faculty of the host institution sometimes assisted by visiting scientists serving as short term lecturers or as full time staff members.

An important part of each institute is the opportunity for teachers to work closely with the university staff, scientists, and teachers in both formal and informal sessions and to discuss common problems. Teachers live on-campus in groups, often with members of the staff, and usually share dining facilities.

Tuition and fees are paid for teachers attending institutes. Teachers receive stipends of not more than $75 a week for the duration of the training, allowances for travel, and allotments for dependents up to four in number.

Nearly 165 of the summer institutes in 1962 will offer courses in multiple fields. Another 118 institutes will be in mathematics, 53 in biology, 39 in chemistry, and 23 in physics. Other institutes offered in cooperation with the Atomic Energy Commission will specialize in radiation in the physical sciences, radiation biology, and isotope technology.

• Science News Letter, 80:414 December 23, 1961