

# An ear to the heavens

November afternoon sunshine warmed the countryside along the Olentangy River, a few kilometres north of Ohio's quiet state capital of Columbus. It was a setting more suitable to the strolling middle-aged golfers nearby than to a search for alien life-forms. But down a gravel side road, two giant walls of steel mesh, 150 m apart and towering over the trees around them, were poised to do just that. For the past 15 years Big Ear, Ohio State University's three-acre radio telescope, has almost continuously been scanning the galaxies night and day under the careful supervision of astronomer Robert Dixon—listening for radio signals that would prove the earth's inhabitants are not alone. "There is life beyond earth," said Dixon. "All the evidence indicates it."

Like hundreds of other scientists and interested amateurs who have devoted years to the Search for Extra-Terrestrial Intelligence (SETI), Dixon has struggled to help the movement gain acceptance as legitimate scientific research. Since the first search by radio telescope

took place in Green Bank, W. Va., in 1960, roughly four dozen short-term projects have come and gone, two of them in Canada. Apart from Big Ear, an independent observatory near Harvard, Mass., is searching the skies and smaller projects are under way in such places as Madrid and Hay River, N.W.T.

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SETI advocates have fought against tight budgets, technical challenges and a scientific community skeptical because of their lack of results. But a new proposal by the U.S. National Aeronautics and Space Administration (NASA) for a \$100-million 10-year search to begin in 1992 is set to go before Congress in January. And next month Dixon and his col-

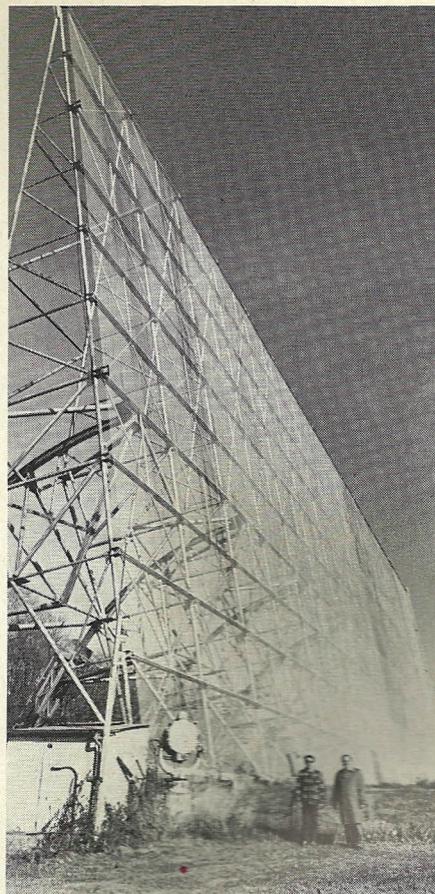
leagues will be ready to activate a complex new computer processing system for Big Ear, which will increase its search capabilities dramatically.

Such developments clearly hearten Dixon, who founded the Big Ear SETI project. Said Dixon: "As the saying goes, absence of evidence is not necessarily evidence of absence. We may not receive a signal in my lifetime—perhaps not for a thousand years. That does not mean we should be discouraged." Dixon's dream is shared by many amateur astronomers. One of them is Robert Stephens, a former electronics technician from Edmonton who for two years has lived at a former Distant Early Warning (DEW) line station in Hay River. There, he has earned the acclaim of experts worldwide with Canada's only SETI program, run on a shoestring budget with a telescope fashioned from two secondhand military dish antennas.

Such search projects as Dixon's and Stephens's are based on the ability of the radio telescope to receive a potentially infinite number of radio waves from space. A computer program instructs the telescope to weed out natural interstellar noise. Some astronomers say that any distinctive remaining signals—if they apparently do not come from such manmade objects as satellites—might be emissions from another life-force. Because of the limited extent

of their technical equipment, researchers have been able to listen to only a small part of the microwave spectrum. Still, they have encountered brief but tantalizing signals, and Dixon predicted that the new Big Ear computer unit will be able to isolate and analyse such signals with greater success. "Up to now, we have seen things," he said, "but they are never there when we go back."

The proposed NASA search excites enthusiasts because the agency's extensive equipment, unlike that of Big Ear and other independent telescopes, would be able to scan the entire microwave spectrum in great detail. And despite cutbacks in NASA's space program spending, Congress may look favorably on SETI programs such as Big Ear because of their relatively low cost. Indeed, Dixon himself is employed as deputy director of the Ohio State computer centre and earns no money from the search activities. And aside from a few thousand dollars in yearly donations, Big Ear's only support is an annual NASA grant of \$20,000. "Bob is really an amazing hero," said Paul Feldman, an astronomer at Ottawa's National Research Council. Feldman himself conducted a two-year search from 1974-1976 at Big Bear Park's federal observatory in Ontario—a facility now closed due to funding cutbacks. "Ohio State is just a step in the bucket," he added, "but



Radio telescope: technical challenges

it's one of the only games in town."

Big Ear has itself at times been threatened. In 1983 the neighboring Delaware Country Club bought the site, intending to expand its private golf course to 18 holes. But local opposition to the plan saved the telescope, which, with its underground control chamber and cement foundation, would have been too expensive to rebuild elsewhere. One high-school science class raised funds selling T-shirts with an alien hand, similar to that of the extraterrestrial movie character E.T., dejectedly holding a telephone receiver. The club agreed to rent the Big Ear site to the university on a renewable eight-year lease.

As the autumn dusk began to throw the moon and stars into faint relief above the horizon, Dixon walked toward a lonely flagpole on the telescope site. As he took down the Flag of Earth—its blue, yellow, black and white design flown at only a few dozen institutions around the world—he said the fact that no civilization has yet left a calling card is no reason to lose hope. "Of course, if we do find a signal," Dixon added, "the scientific big guns will move in with a steamroller, and our efforts will be forgotten." Then he smiled. "But that would be all right. We would have done what we intended to do."

—JULIA BENNETT in Columbus