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Cover: A modern steel mill can offer truly awe-inspiring sights. In Sydney Steel Corporation's Cape Breton Island steel mill, molten metal is poured into a mold during rail fabrication (Story page 4). Photograph by Bruce Kane, NRC.

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## Grote Reber -Early radio astronomer



N. W. Broten, Herzberg Institute of Astrophysics/Institut Herzberg d'astrophysique

Full-sized reconstruction of Mr. Reber's original antenna located at radio telescope facility, Greenbank, West Virginia.

Thomas Alva Edison is credited with noting that the process of invention is "90 per cent perspiration and 10 per cent inspiration." An able exponent of this philosophy visited the Herzberg Institute of Astrophysics early this summer, recalling his early efforts in the field of radio astronomy. Grote Reber, one of the pioneer experimenters in radio mapping the Milky Way, related his experiences over the twoyear period he spent confirming the findings of Karl Jansky, the first person to detect radio signals emanating from space in 1932. Inspired by Jansky's work, Reber began a series of investigations of his own in what was then a totally new area of research.

In an era of depression, with little or no money for research, Grote Reber fell back on a reliable resource — his own ingenuity. After graduating from the Illinois Institute of Technology, he went to work in the growing electronics industry in Chicago. This enabled him to "put the bite on electronics salesmen passing through the area for the latest in equipment." His family owned land in a far western suburb of the city, providing him with space to erect an antenna, and free of the city's sources of spurious signals. More than two years was spent developing both the antenna and his receiver system. Cette antenne située à Greenbank, en Virginie-Occidentale, est l'exacte réplique de l'antenne originale de Reber.

A major obstacle was the lack of information in the new field. "You have to remember," he said "that at the time ignorance was profound." Instead of designing equipment to theory, he based his design on the limitations of local materials and workmanship.

Reber's ultimate success in the spring of 1939 was a credit to Edison's faith in perspiration. He began a program of radio mapping the night sky and so provided an unequivocal confirmation of Jansky's findings of seven years before.

In the post-war years, seeking information on the action of celestial radio waves in the upper atmosphere, Grote Reber found he was again breaking new ground. Having established an antenna site atop a volcano in the Hawaiian Islands, he recorded some unexplained signals, the source later being identified as the planet Jupiter.

Utilizing an antenna site on the Australian island of Tasmania, Reber subsequently conducted a series of studies in radio mapping of the Milky Way. This site is still active, although Reber himself is no longer engaged in research. His career opened many new and continuing fields of research and may be considered a foundation stone to NRC's own Herzberg Institute.