Young Readers Edition

THE UNIVERSE

David Bergamini

and the Editors of TIME-LIFE BOOKS

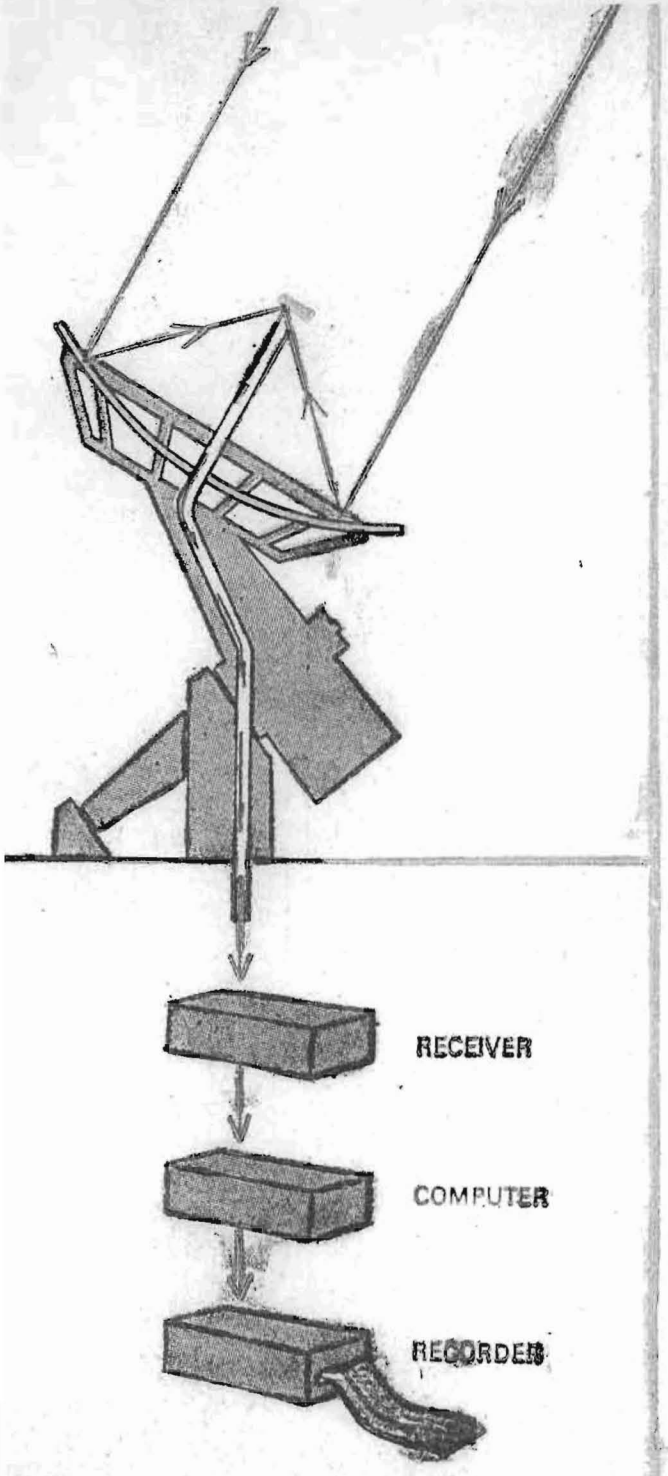
Mighty Instruments to Probe the Skies

In 1850, at about the same time as the invention of the spectroscope, photographic plates were first deliberately exposed to the stars by John Whipple at the Harvard College Observatory. Because they were permanent, reliable records, photographs soon replaced the sketches or written descriptions that were the only means astronomers had to record their observations until then.

But photography was even more useful than this. If an astronomer stares at a group of stars all night long, his eye senses no more light than it does in a wink. A photographic plate, on the contrary, gradually collects more and more information: where a 10-second exposure may reveal only 20 fairly bright stars, a 10-hour exposure may show 2,000 stars that are too faint to be seen by the human eye even when assisted by the finest telescope in the world.

An even more far-reaching development was the discovery of invisible radio waves as a means of observing and charting the skies. The first scientist to explore this field was Karl Jansky at the Bell Telephone Laboratories in the late 1920s and early 1930s. All that young Jansky had to start with was unexplained static in transoceanic radiotelephones. His job was to find out where the static came from so that the telephone company could reduce it. But when the source of the static proved difficult to pinpoint, Jansky invented something brand new to track it down. He built a radio antenna 60 feet long -- the first "radio telescope" in the world -- and mounted it on four old wheels on a circular cinder-block track. By rotating this contraption and carefully recording all the radio signals it received, he was able to divide the static of one important short-wave frequency into three categories: bangs from nearby thunderclaps, clicks from distant thunderclaps -- and a steady whisper from outer space.

Jansky's mysterious whisper turned out to be the strong radio noise that emanates from the nucleus of the Milky Way. Another young investigator, Grote Reber, took up the challenge. Reber read Jansky's report and by 1937 he was eavesdropping on the universe with the aid of a 33-foot sheet-metal dish he assembled in his back yard. Reber confirmed that the nucleus of the galaxy -- invisible to optical telescopes because it was hidden behind obscuring clouds of gas and dust -- was a signal source. He also located several other "hot spots" in the sky that did not seem to coincide with any visible objects. His first reports were published in 1940. During World War II there were few opportunities to pursue these clues. But after the war, investigators around the world set up antennae and began gathering information. It soon was apparent that Jansky and Reber had founded a whole new field of study -- radio astronomy.



TUNING IN ON SPACE

A radio telescope is a huge instrument designed for collecting weak radio signals from faraway stars; it is also used for tracking spacecraft in their distant orbits. The type shown here uses a large dish to concentrate the waves on the antenna, which is mounted above the center of the dish. The waves are first amplified by a receiver (left), then sent to a computer that sorts out the static. A recorder finally transcribes the signals on a graph.

See next Universe Story in this paper

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June 4, 1970
Recd 6th

THE OHIO STATE UNIVERSITY
RADIO OBSERVATORY
Attn: Mr. Grote Reber
Box 293
Delaware, Ohio 43015

It was a pleasure, Mr. Reber . . .

. . . to hear from you by your letter of May 20th. We were embarrassed to find that we cannot locate my letter of the 13th to you. Most likely it was misfiled.

I did however find your name in last Sunday's Los Angeles Times and am pleased to enclose the clipping. Along with this of course, is our catalog G4-2, describing the Dillon Model X Force Gauge.

On the front cover of the catalog I have circled a small knob which locks the bezel in position. The dial is attached by friction to the bezel. Therefore, releasing the pressure on this knob allows you to rezero the instrument. However, this should not be considered as a tare control for two reasons. The instrument is not linear; and it was not designed to take an overload of more than 20% of capacity.

As indicated on Page 4, the tension model in the 0-250 lb. range is priced at $168.00. Shipment of two of these can go forward within 5-7 days after receipt of a covering order. Terms are ½% 10 Days, Net 30 Days; all prices being F.O.B. Van Nuys, California.

Trusting this is the information you require, Mr. Reber, and looking forward to hearing from you favorably, I remain,

Cordially yours,
W. C. DILLON & COMPANY, INC.

Ron Magid
Product Sales Manager

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encl.