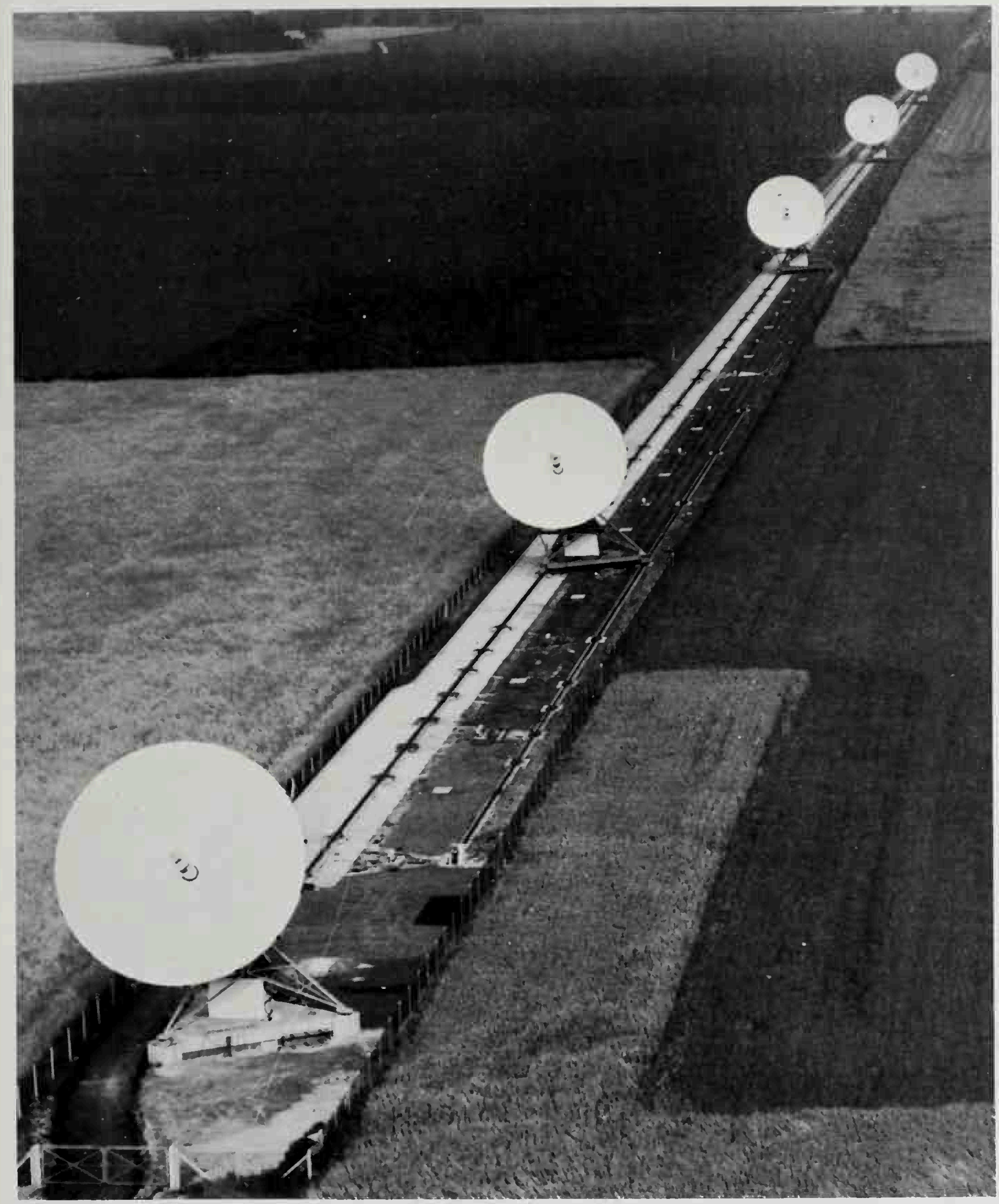

An aerial view of the eight 13m reflectors of the 5 km aperture synthesis radio telescope at the Mullard Radio Astronomy Observatory at Cambridge University.

radio waves means that aperture for aperture, a radio telescope has much less satisfactory resolving power. To quantify it, whereas the theoretical resolving power of the 2·5-m (100-inch) telescope is 0·05 arc sec., that of the 76-m Jodrell Bank radio telescope is a little less than 12 arc minutes at a wavelength of 21 cm. To obtain a resolving power that is useful for detecting single small radio sources it is obviously necessary to use some sort of interferometer and interferometric techniques have become highly developed in radioastronomy.

One type of interferometer is that devised by Bernard Mills in Australia in 1957. This, the **Mills Cross**, consists of two arrays of antennae with long narrow parabolic reflectors, the arrays lying perpendicular to each other. By electronically combining the signals from the arrays, the instrument gives a **pencil beam** resolution centred on the point of intersection of the arrays. With arrays each of 1 km length, such an instrument can give a resolution of 1·4° at a long wavelength like 15 m, whereas the Jodrell Bank instrument would only provide a resolution of 4° at this wavelength. Another development is the **grating interferometer** designed originally by Willem Christiansen for solar work, where the arrays of antennae are composed of a series of small dishes. Such a telescope is good for resolving detail across a strip of sky.

Probably the most notable design of radio interferometer is that due primarily to Sir Martin Ryle and his