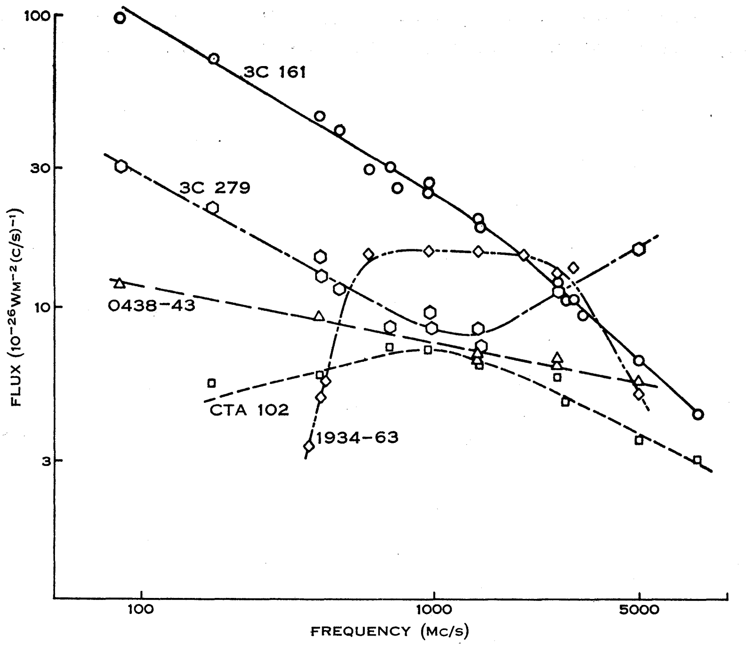

Fig. 1.—Spectra of five radio sources derived from the work of various authors, together with the new 5000-Mc/s observations at Parkes.

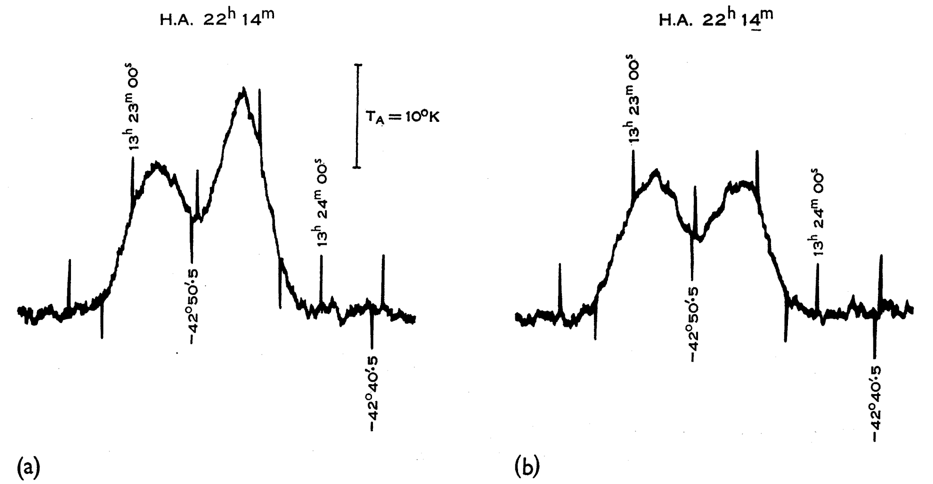

Fig. 2.—Scans through the central double source of Centaurus A from south-west to north-east. (*a*) Feed horn oriented for maximum signal from the north-east (right-hand) source; position angle of E vector $= 132°$. (*b*) Feed horn oriented for minimum signal from this source; position angle of E vector $= 42°$.

Scans made through the north-east source in various directions and with various feed angles show that the polarized region of the north-east source is smaller than the unpolarized region, confirming a conclusion recently reached at the California

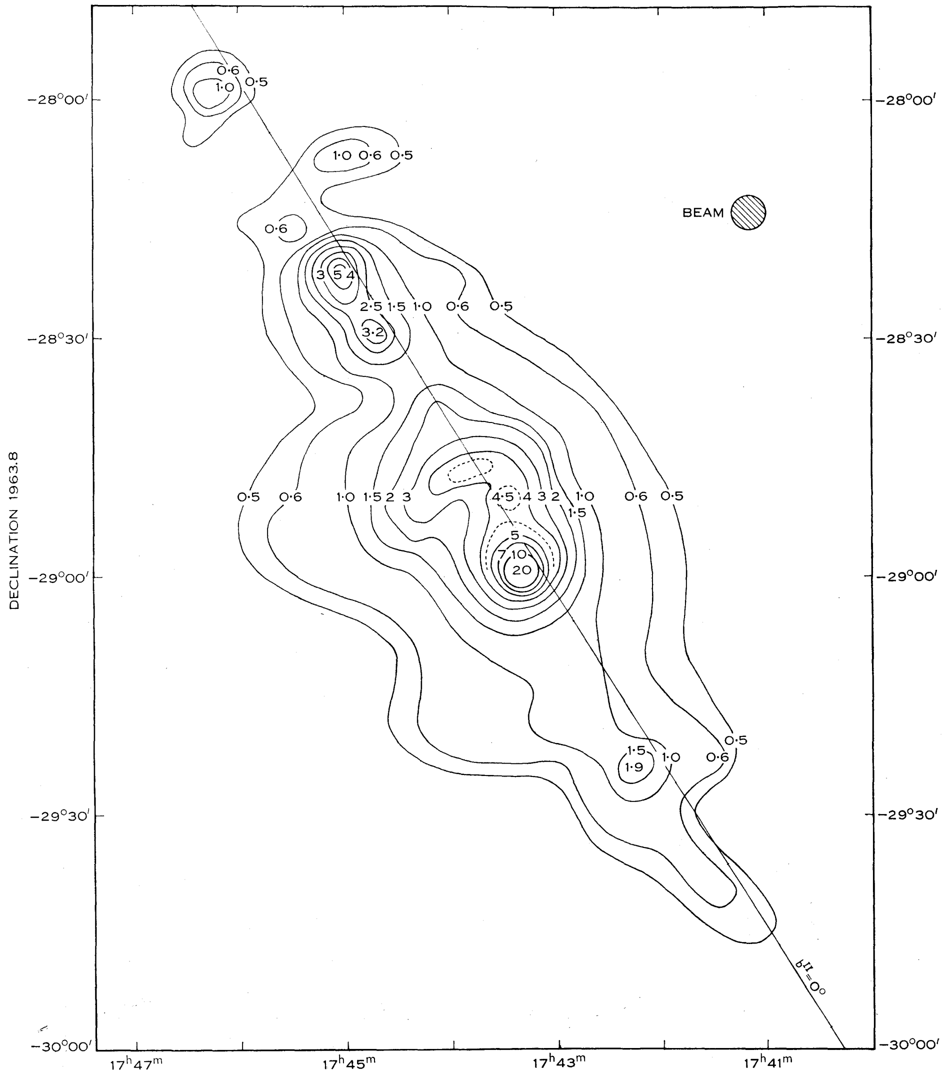

Fig. 3.—Isophotes of relative brightness of a region about the galactic centre (contour level $1 \cdot 0$ equals about $2 \cdot 3$°K antenna temperature).

Institute of Technology (Morris, Radhakrishman, and Seilstad 1963) using an interferometer at $10 \cdot 7$ cm wavelength. The equivalent Gaussian diameter of the polarized region is not more than $2'$ at half intensity while the unpolarized regions of both sources are approximately $3 \cdot 5 \times 2'$ in angular extent. The sources are elongated in the general direction of the line joining their centres as shown by Maltby (1961).

The flux density at 6 cm wavelength of the north-east source is estimated to be $71 \pm 20 \times 10^{-26}$ $Wm^{-2}(c/s)^{-1}$ and that of the south-west source $55 \pm 13 \times 10^{-26}$ $Wm^{-2}(c/s)^{-1}$.

The Galactic Centre

The region in the direction of the galactic centre is made up of a group of sources, the brightest of which, Sagittarius A, is generally considered to be associated with the nucleus of our Galaxy. Previous high resolution pencil-beam surveys of this region by Drake (1959), by Biraud, Lequeux, and Le Roux (1960), and by Cooper and Price (1964) have shown much of the structure. Contours of constant antenna temperature at 6 cm wavelength are shown in Figure 3.

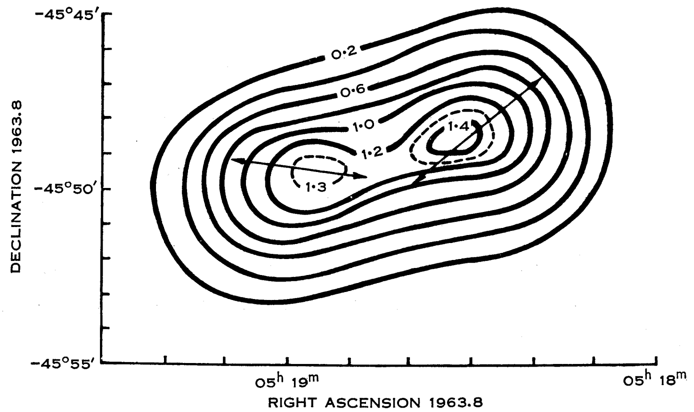

Fig. 4.—Isophotes of relative brightness of the extragalactic source Pictor A showing the direction of maximum polarization in the two components (contour level 1·0 equals 2·6°K antenna temperature). Mean position angle of E vector of feed = 98°.

To the north-east of the central peak there is a source showing marked elongation in galactic latitude and a "hook" appearance. This structure appears in lesser details in Drake's isophotes at 3·74 cm, but there is only slight evidence of it in the 10-cm observations of Cooper and Price. The emission at $17^h 45^m$ and $-28° 22'$, previously shown as an extended region, is well resolved into a double source lying nearly along the galactic equator.

The position of the bright central component, in 1950 coordinates is: right ascension $17^h 42^m 27^s{\cdot}7 \pm 4^s$, declination $-28° 59'{\cdot}0 \pm 1'{\cdot}0$. This is about 1^s east and 4′ south of the new IAU coordinates of the galactic centre.

Pictor A

A 6-cm map of the extragalactic source Pictor A (Fig. 4) shows that the source is extended in position angle $104° \pm 2°$, and is resolved into two components, each of which is also elongated along this direction. The transverse widths of the two components are about 2′, but vary with feed position angle. The component at $05^h\,18^m\,30^s$ is $11\%\pm2\%$ polarized and the component at $05^h\,18^m\,55^s$ is $9\%\pm2\%$ polarized. The mean intrinsic polarization angle, with 9° of Faraday rotation from Gardner and Whiteoak's (1963) measurements, is $101°\pm15°$. This alignment between the mean polarization direction and the elongation of the source has been found in other sources of low surface brightness.

Conclusion

The measurements described above demonstrate that the 210-ft reflector has a useful performance at a wavelength of 6 cm and justify extending the scope of the Parkes observations in this region. A more sensitive receiver now under construction will be used for this purpose and for a fuller investigation of the high frequency performance of the reflector itself.

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