A CATALOGUE OF RADIO SOURCES BETWEEN DECLINATIONS −20° AND −50°

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Summary

A catalogue has been prepared of the radio sources observed between declinations −20° and −50°, using the Sydney cross-type radio telescope at a wavelength of 3·5 m; a total of 892 sources is listed. This supplements an earlier catalogue in the declination zone +10° to −20°. In addition to the positions and intensities of the sources, angular sizes of 50 of the strongest are given; several are found to have a size less than 15″ arc. As before, identifications with bright optical objects have been sought, and a number of galaxies of apparently abnormal radio emission listed. Statistical analyses of the distribution of the radio sources give results very similar to those obtained using the earlier catalogue. Within the uncertainty in the data, the distribution appears uniform in depth and there is a significantly greater number of sources of large apparent size than expected from chance blending effects.

I. Introduction

Analysis has been continuing of the records taken with the Sydney 3·5 m cross-type radio telescope. A catalogue of radio sources has now been prepared between declinations −20° and −50° to add to the previously published catalogue between +10° and −20° (Mills, Slee, and Hill 1958); the zone between −50° and −80°, which will complete the series, is in preparation. In the present catalogue a total of 892 radio sources is listed in the area of 2·66 steradians. The source density, 336 per steradian, is somewhat less than the previous figure of 356 per steradian, but not significantly so in view of the inclusion in the catalogue of the brightest regions of the Milky Way and the brightest southern extragalactic source: these cause a marked reduction in the listings of faint sources in their vicinity because of increased background temperatures and side-lobe effects.

The catalogue has been examined in the same manner as the earlier one for identifications with optical objects and for the statistics of the radio source distribution. Since the present data add little to the earlier conclusions and since more data will be available soon from the final catalogue zone, these results are discussed only briefly.

The present catalogue differs from the earlier one in that angular sizes are given for about 50 sources unresolvable with the pencil-beam aerial. These have been obtained with the newly developed angular size interferometer (Goddard, Watkinson, and Mills 1960). Since the sizes of many more sources

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in the catalogue will be available shortly, the analysis and discussion of the results is postponed. It is interesting, however, that a number of radio sources are listed which could not be resolved by the instrument. These have been estimated to be smaller than 10–15″ arc.

II. The Catalogue

Preparation of the catalogue follows the methods described in two earlier papers (Mills and Slee 1957; Mills, Slee, and Hill 1958); subsequently these papers will be referred to as paper I and paper II respectively. The catalogue is divided into three zones covering declinations $-20°$ to $-30°$, $-30°$ to $-40°$, and $-40°$ to $-50°$; they are given in Tables 1, 2, and 3. The previously used scheme of reference numbers has been adopted in which the first two digits of the number denote the hour of the Right Ascension; these are followed by the sign of the declination and the tens digit measured in degrees and, finally, an italicized serial number arranged in order of increasing Right Ascension within the 1-hr period. Only the latter italicized numbers are given in the tables, as the others are evident; for example in Table 1, the second source would be referred to in the text as 00−2*2*.

As before, the probable error in the final digit of a position is indicated by a superscript. The positions given are directly as measured, with allowances only for precession. In the catalogue of paper II the sources of highest accuracy for which the estimated probable error in R.A. was $\pm 0\cdot 1^{\mathrm{m}}$ were corrected by $+4^{\mathrm{s}}$. This correction was based on the differences between the apparent radio and optical positions of six bright identified galaxies. However, two of these galaxies are of large angular size and complex structure so that differences are probably not significant, and in two other cases our uncorrected positions were confirmed by other observers. It therefore appears probable that the systematic error in our positions is negligible and no such corrections have been applied in the present catalogue. Radio sources resolved by the aerial beam have been treated as before, both their peak flux density and their integrated flux density being given, the former in parentheses. In general, only sources with apparent angular size less than 2° have been included in the catalogue, two exceptions being the well-established sources at the galactic centre, 17−2*13*, and Centaurus A, 13−4*2*. When the size of a source has been measured using the angular size interferometer it is given in the footnotes in units of seconds of arc. These are "equivalent" sizes and refer to a circularly symmetric source of Gaussian brightness distribution which has the same ratio of visibilities at spacings of 30λ and 2920λ (Goddard, Watkinson, and Mills 1960). The measurements are preliminary and are likely to be improved later. Possible identifications with bright nebulae are also given in the footnotes; when the NGC number is in parentheses there appears to be no reason for thinking that this is other than an accidental coincidence in position. These and other possible identifications are discussed briefly in the next section.

A small portion of the catalogue is included in an area examined by Rishbeth (1958), who gave contour diagrams and a short catalogue of radio sources in the Vela-Puppis region near 08^{h} R.A. In general our catalogues agree quite closely,

Table 1

SOURCES BETWEEN DECLINATIONS —20° AND —30°

Sources which may be " extended ", that is, resolvable, are indicated by a dagger. A colon has been placed beside uncertain flux densities. Angular sizes, where available, are indicated in the footnotes. Details in Section II

Ref. No.	Position (1950) R.A. (h m)	Position (1950) Dec. S. (° ′)	Flux Density (10^{-26} W m^{-2} $(c/s)^{-1}$)
	00		
1	$01\cdot2^3$	$22\ 40^8$	6
2	$02\cdot1^3$	$23\ 22^7$	10
3	$07\cdot1^3$	$28\ 55^6$	8
4	$10\cdot0^3$	$23\ 43^7$	8
5	$16\cdot0^3$	$22\ 37^7$	13
6	$17\cdot7^3$	$20\ 40^6$	13
7	$20\cdot7^2$	$25\ 22^5$	21
8	$21\cdot2^4$	$21\ 15^8$	14†
9	$21\cdot9^3$	$29\ 43^4$	33[(1)]
10	$22\cdot0^2$	$26\ 16^6$	17†
11	$24\cdot3^4$	$20\ 47^7$	7
12	$24\cdot3^4$	$27\ 51^8$	5
13	$25\cdot3^4$	$28\ 21^7$	9
14	$29\cdot9^3$	$24\ 32^5$	7
15	$30\cdot5^4$	$22\ 09^7$	8
16	$33\cdot2^2$	$20\ 18^4$	19
17	$35\cdot2^5$	$26\ 41^8$	5
18	$35\cdot5^2$	$23\ 12^5$	10
19	$36\cdot9^4$	$29\ 24^7$	8
20	$38\cdot1^3$	$27\ 47^8$	6
21	$42\cdot0^2$	$22\ 21^5$	9
22	$45\cdot1^2$	$25\ 38^4$	29[(2)]
23	$54\cdot4^4$	$26\ 23^7$	9
24	$56\cdot5^3$	$29\ 21^8$	8
	01		
1	$00\cdot1^2$	$22\ 11^4$	35[(3)]
2	$00\cdot6^3$	$27\ 43^6$	16
3	$06\cdot2^3$	$29\ 06^7$	9
4	$10\cdot6^3$	$22\ 19^6$	9†
5	$13\cdot7^3$	$23\ 01^6$	8
6	$13\cdot9^3$	$21\ 07^5$	*24* (18)
7	$13\cdot9^5$	$28\ 41^6$	12
8	$17\cdot9^4$	$27\ 25^8$	7
9	$22\cdot4^4$	$25\ 25^7$	9
10	$24\cdot2^3$	$22\ 28^7$	8
11	$28\cdot7^2$	$26\ 27^5$	18
12	$34\cdot1^4$	$24\ 05^8$	6
13	$35\cdot9^4$	$23\ 05^8$	5
14	$39\cdot2^4$	$25\ 57^7$	7
15	$39\cdot6^3$	$27\ 21^7$	16
16	$43\cdot3^4$	$24\ 16^6$	12
17	$48\cdot7^2$	$29\ 44^4$	*63* (43)
18	$50\cdot0^4$	$27\ 23^7$	11
19	$55\cdot0^5$	$21\ 09^7$	10
	02		
1	$02\cdot8^4$	$23\ 50^8$	10
2	$05\cdot2^3$	$22\ 32^7$	16
3	$08\cdot5^4$	$28\ 01^7$	8†
4	$09\cdot3^4$	$23\ 48^6$	9
5	$16\cdot4^3$	$24\ 59^5$	15
6	$21\cdot5^3$	$28\ 31^6$	11
7	$22\cdot2^3$	$23\ 21^5$	19
8	$24\cdot1^5$	$23\ 58^7$	10[(4)]
9	$26\cdot8^5$	$24\ 03^7$	9[(4)]
10	$29\cdot9^4$	$20\ 43^7$	11
11	$31\cdot4^4$	$23\ 43^6$	17
12	$33\cdot5^2$	$29\ 11^6$	8
13	$39\cdot8^4$	$28\ 12^8$	7
14	$42\cdot6^3$	$21\ 56^8$	9
15	$44\cdot0^3$	$23\ 57^7$	8
16	$45\cdot4^2$	$29\ 28^7$	10†
17	$46\cdot7^2$	$20\ 42^7$	14
18	$53\cdot4^4$	$22\ 09^7$	9
19	$54\cdot2^2$	$23\ 32^6$	28
20	$54\cdot7^3$	$20\ 46^6$	13
21	$54\cdot7^3$	$26\ 18^7$	7
22	$59\cdot8^4$	$29\ 18^5$	8

(1) $\sim 20''$.

(2) NGC 253.

(3) $\sim 30''$.

(4) Sources 02–*28*, 02–*29* form perhaps one extended source.

TABLE 1 (*Continued*)

Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)
	03		
1	$04{\cdot}1^{4}$	$24\ 08^{5}$	7
2	$05{\cdot}2^{4}$	$22\ 31^{8}$	17
3	$13{\cdot}8^{2}$	$27\ 14^{6}$	23
4	$25{\cdot}5^{3}$	$23\ 07^{7}$	15 [5]
5	$27{\cdot}2^{3}$	$26\ 08^{7}$	14
6	$30{\cdot}7^{3}$	$27\ 23^{7}$	8
7	$37{\cdot}2^{3}$	$28\ 46^{5}$	9
8	$37{\cdot}6^{5}$	$24\ 14^{8}$	8
9	$38{\cdot}1^{4}$	$21\ 40^{7}$	*14* (9)
10	$45{\cdot}4^{2}$	$29\ 26^{5}$	15
11	$46{\cdot}7^{4}$	$21\ 37^{7}$	9
12	$49{\cdot}7^{2}$	$27\ 57^{5}$	53 [6]
13	$52{\cdot}1^{4}$	$25\ 45^{7}$	11†
14	$58{\cdot}7^{4}$	$24\ 38^{6}$	9
	04		
1	$06{\cdot}3^{3}$	$24\ 15^{5}$	14
2	$06{\cdot}7^{3}$	$22\ 52^{6}$	10
3	$12{\cdot}9^{2}$	$29\ 40^{5}$	17
4	$13{\cdot}7^{3}$	$21\ 04^{7}$	26
5	$14{\cdot}7^{3}$	$22\ 07^{8}$	8
6	$20{\cdot}3^{4}$	$26\ 33^{4}$	11
7	$22{\cdot}5^{4}$	$20\ 04^{6}$	7
8	$26{\cdot}7^{4}$	$27\ 03^{6}$	15†
9	$27{\cdot}9^{3}$	$28\ 07^{5}$	12
10	$30{\cdot}4^{5}$	$23\ 34^{7}$	7
11	$30{\cdot}7^{3}$	$29\ 49^{6}$	13
12	$30{\cdot}9^{4}$	$24\ 44^{7}$	8
13	$32{\cdot}7^{3}$	$25\ 33^{6}$	8
14	$34{\cdot}6^{5}$	$20\ 45^{8}$	5
15	$34{\cdot}8^{3}$	$22\ 32^{6}$	10
16	$36{\cdot}7^{5}$	$27\ 21^{8}$	8
17	$37{\cdot}1^{5}$	$24\ 39^{8}$	8
18	$42{\cdot}7^{1}$	$28\ 18^{3}$	82 [7]
19	$45{\cdot}9^{3}$	$20\ 40^{5}$	19
20	$50{\cdot}4^{3}$	$28\ 36^{7}$	12
21	$52{\cdot}9^{3}$	$22\ 04^{5}$	*38* (21)
22	$53{\cdot}3^{3}$	$20\ 36^{4}$	18
23	$56{\cdot}5^{4}$	$23\ 43^{7}$	7

Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)
	05		
1	$01{\cdot}9^{5}$	$25\ 51^{8}$	8
2	$03{\cdot}6^{2}$	$28\ 41^{4}$	*60* (30)
3	$08{\cdot}4^{3}$	$22\ 06^{6}$	19†
4	$19{\cdot}0^{3}$	$20\ 31^{6}$	19: [8]
5	$25{\cdot}5^{4}$	$23\ 21^{7}$	9
6	$28{\cdot}6^{4}$	$20\ 55^{7}$	8
7	$40{\cdot}9^{4}$	$24\ 16^{6}$	13
8	$41{\cdot}1^{4}$	$27\ 28^{6}$	7
9	$41{\cdot}9^{3}$	$21\ 08^{6}$	10
10	$43{\cdot}2^{3}$	$26\ 27^{5}$	12
11	$49{\cdot}7^{3}$	$21\ 20^{5}$	8
12	$52{\cdot}9^{4}$	$22\ 47^{8}$	9
	06		
1	$02{\cdot}8^{4}$	$28\ 56^{6}$	7
2	$04{\cdot}6^{2}$	$20\ 13^{5}$	23
3	$15{\cdot}9^{3}$	$28\ 16^{7}$	9
4	$19{\cdot}1^{4}$	$24\ 08^{8}$	9
5	$19{\cdot}4^{3}$	$27\ 21^{6}$	9 [9]
6	$20{\cdot}1^{3}$	$26\ 05^{7}$	7
7	$21{\cdot}0^{3}$	$25\ 18^{7}$	11†
8	$24{\cdot}5^{4}$	$20\ 35^{7}$	11
9	$30{\cdot}4^{4}$	$27\ 16^{6}$	12
10	$34{\cdot}7^{1}$	$20\ 37^{4}$	*85* (67)
11	$37{\cdot}4^{3}$	$27\ 36^{7}$	17
12	$37{\cdot}7^{3}$	$28\ 40^{6}$	17
13	$51{\cdot}0^{3}$	$21\ 20^{6}$	9
14	$51{\cdot}2^{4}$	$22\ 32^{7}$	8
15	$55{\cdot}5^{3}$	$26\ 40^{7}$	16†
16	$56{\cdot}9^{1}$	$24\ 13^{4}$	59 [10]

(5) Possible confusion with IAU 03S3A side lobe.
(6) 40″.
(7) 35″.
(8) Possible confusion with IAU 05S4A side lobe.
(9) (NGC 2217).
(10) $\geqslant 45''$.

TABLE 1 (*Continued*)

Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} $(c/s)^{-1}$)
	07		
1	$04\cdot2^{3}$	$22\ 58^{6}$	6
2	$06\cdot9^{3}$	$29\ 14^{7}$	*45* (22)[11]
3	$09\cdot0^{2}$	$20\ 34^{4}$	*71* (33)[11]
4	$15\cdot4^{3}$	$24\ 57^{6}$	17
5	$16\cdot1^{3}$	$26\ 28^{6}$	18†
6	$20\cdot1^{3}$	$21\ 55^{6}$	11
7	$21\cdot9^{3}$	$23\ 28^{7}$	15†
8	$24\cdot7^{3}$	$24\ 51^{6}$	10
9	$25\cdot5^{3}$	$20\ 39^{6}$	10
10	$25\cdot8^{4}$	$28\ 45^{7}$	15†
11	$27\cdot2^{3}$	$22\ 06^{5}$	16†
12	$39\cdot2^{4}$	$24\ 18^{8}$	*38* (24)
13	$40\cdot7^{3}$	$28\ 15^{8}$	13
14	$50\cdot5^{4}$	$21\ 47^{8}$	8
15	$50\cdot9^{4}$	$26\ 20^{7}$	13
16	$54\cdot4^{4}$	$23\ 28^{8}$	7
	08		
1	$12\cdot3^{3}$	$23\ 33^{8}$	7
2	$12\cdot9^{3}$	$24\ 48^{7}$	10
3	$18\cdot3^{3}$	$29\ 46^{6}$	16
4	$25\cdot1^{2}$	$20\ 15^{5}$	26
5	$25\cdot1^{4}$	$23\ 13^{7}$	11
6	$26\cdot7^{5}$	$21\ 30^{8}$	8†
7	$33\cdot1^{4}$	$24\ 49^{8}$	11
8	$34\cdot5^{3}$	$26\ 00^{7}$	9
9	$34\cdot8^{3}$	$27\ 01^{6}$	16
10	$35\cdot7^{4}$	$22\ 19^{7}$	9
11	$42\cdot7^{5}$	$26\ 30^{8}$	14†
12	$43\cdot0^{4}$	$23\ 30^{6}$	15
13	$43\cdot4^{3}$	$29\ 35^{7}$	12[12]
14	$43\cdot9^{4}$	$22\ 37^{8}$	9
15	$50\cdot8^{4}$	$22\ 52^{7}$	8
16	$50\cdot9^{3}$	$20\ 36^{6}$	19
17	$55\cdot3^{3}$	$21\ 18^{7}$	7
18	$56\cdot4^{3}$	$27\ 18^{6}$	13
19	$59\cdot6^{2}$	$25\ 49^{5}$	54[13]
	09		
1	$05\cdot7^{4}$	$29\ 21^{8}$	9
2	$20\cdot4^{5}$	$27\ 24^{7}$	8
3	$21\cdot5^{3}$	$21\ 05^{8}$	7
4	$24\cdot5^{4}$	$25\ 57^{8}$	10
5	$26\cdot2^{4}$	$29\ 48^{6}$	13
6	$30\cdot7^{3}$	$20\ 07^{7}$	12
7	$35\cdot3^{4}$	$28\ 50^{8}$	16:†
8	$36\cdot5^{3}$	$25\ 40^{6}$	12
9	$42\cdot7^{5}$	$27\ 50^{8}$	8
10	$47\cdot4^{2}$	$24\ 59^{8}$	19
11	$51\cdot0^{3}$	$23\ 48^{6}$	9
12	$56\cdot0^{3}$	$28\ 55^{8}$	*30* (18)[11]
13	$56\cdot6^{3}$	$20\ 25^{8}$	6
14	$59\cdot6^{3}$	$23\ 38^{6}$	15
	10		
1	$02\cdot8^{2}$	$21\ 31^{5}$	48[14]
2	$06\cdot5^{4}$	$30\ 00^{6}$	10
3	$08\cdot5^{4}$	$28\ 30^{8}$	8[15]
4	$10\cdot9^{3}$	$27\ 50^{8}$	12
5	$12\cdot5^{3}$	$23\ 38^{6}$	10
6	$24\cdot6^{3}$	$29\ 46^{6}$	9
7	$30\cdot8^{3}$	$23\ 37^{7}$	18†
8	$35\cdot5^{4}$	$24\ 50^{8}$	8
9	$35\cdot9^{4}$	$28\ 58^{7}$	10
10	$35\cdot9^{3}$	$26\ 10^{6}$	15
11	$40\cdot1^{4}$	$23\ 20^{7}$	12
12	$42\cdot7^{3}$	$28\ 46^{7}$	14†
13	$43\cdot0^{4}$	$22\ 10^{7}$	9[16]
14	$48\cdot9^{4}$	$20\ 19^{7}$	10
15	$53\cdot2^{3}$	$26\ 00^{7}$	11
16	$53\cdot5^{4}$	$27\ 43^{8}$	13†

(11) Perhaps several sources.
(12) Perhaps one extended source with 08–37.
(13) 32″.
(14) <10″.
(15) A doubtful source.
(16) Perhaps a background irregularity.

TABLE 1 (*Continued*)

Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} $(c/s)^{-1}$)
	11		
1	$03\cdot2^{3}$	$24\ 33^{7}$	8[16]
2	$03\cdot3^{3}$	$20\ 52^{5}$	16
3	$08\cdot1^{3}$	$22\ 51^{6}$	16
4	$15\cdot9^{3}$	$25\ 55^{7}$	9
5	$27\cdot1^{3}$	$28\ 53^{6}$	19†
6	$29\cdot6^{3}$	$26\ 56^{7}$	8
7	$38\cdot1^{2}$	$26\ 18^{4}$	28
8	$39\cdot0^{2}$	$28\ 30^{5}$	27
9	$49\cdot8^{2}$	$30\ 00^{6}$	7
10	$51\cdot7^{4}$	$28\ 08^{8}$	9
11	$52\cdot1^{3}$	$28\ 11^{7}$	13
12	$55\cdot7^{4}$	$22\ 07^{8}$	15
	12		
1	$08\cdot4^{3}$	$25\ 02^{6}$	14†
2	$09\cdot8^{5}$	$26\ 56^{10}$	7
3	$18\cdot5^{3}$	$27\ 40^{7}$	10
4	$19\cdot2^{4}$	$26\ 46^{7}$	10†
5	$22\cdot7^{4}$	$25\ 51^{8}$	15†
6	$25\cdot1^{3}$	$20\ 52^{6}$	12
7	$32\cdot9^{2}$	$24\ 57^{4}$	28:
8	$37\cdot7^{4}$	$20\ 10^{7}$	9
9	$38\cdot3^{3}$	$23\ 19^{6}$	9†
10	$40\cdot9^{3}$	$27\ 27^{6}$	17†
11	$45\cdot0^{4}$	$28\ 58^{6}$	18
12	$51\cdot7^{2}$	$29\ 03^{4}$	47[17]
13	$55\cdot8^{4}$	$25\ 25^{7}$	8
14	$56\cdot6^{3}$	$23\ 08^{6}$	27:
15	$59\cdot0^{3}$	$20\ 09^{5}$	16
	13		
1	$02\cdot7^{3}$	$20\ 53^{8}$	11
2	$03\cdot5^{5}$	$25\ 00^{6}$	15
3	$09\cdot0^{2}$	$22\ 00^{4}$	61[18]
4	$12\cdot2^{4}$	$24\ 58^{7}$	9
5	$34\cdot7^{3}$	$29\ 32^{6}$	36[19]
6	$36\cdot9^{3}$	$21\ 05^{7}$	14
7	$45\cdot9^{4}$	$25\ 14^{7}$	17:
8	$50\cdot7^{4}$	$23\ 38^{8}$	9
9	$55\cdot7^{4}$	$23\ 35^{8}$	9
10	$56\cdot7^{3}$	$21\ 55^{6}$	8†
	14		
1	$03\cdot8^{2}$	$27\ 18^{5}$	20
2	$08\cdot0^{3}$	$22\ 27^{7}$	8:
3	$08\cdot8^{3}$	$27\ 29^{7}$	13
4	$09\cdot8^{3}$	$20\ 18^{6}$	12:
5	$10\cdot9^{5}$	$23\ 38^{7}$	19
6	$14\cdot1^{3}$	$21\ 24^{5}$	17
7	$19\cdot5^{3}$	$29\ 18^{6}$	15
8	$20\cdot2^{3}$	$27\ 14^{5}$	40[20]
9	$20\cdot6^{3}$	$24\ 52^{6}$	14
10	$21\cdot7^{4}$	$29\ 42^{6}$	26
11	$22\cdot0^{4}$	$23\ 48^{7}$	17
12	$25\cdot6^{3}$	$21\ 47^{10}$	*18* (11)[11]
13	$39\cdot0^{3}$	$26\ 28^{5}$	24
14	$39\cdot0^{3}$	$24\ 38^{7}$	9:
15	$54\cdot7^{3}$	$28\ 21^{9}$	7
	15		
1	$03\cdot8^{3}$	$22\ 20^{7}$	10
2	$05\cdot1^{4}$	$26\ 27^{6}$	9
3	$05\cdot8^{4}$	$29\ 23^{5}$	*35* (20)
4	$07\cdot0^{3}$	$20\ 13^{6}$	9
5	$07\cdot9^{5}$	$25\ 15^{7}$	7[16]
6	$11\cdot9^{3}$	$22\ 22^{6}$	9[21]
7	$18\cdot0^{5}$	$28\ 13^{6}$	7
8	$25\cdot2^{4}$	$26\ 42^{6}$	11
9	$26\cdot7^{4}$	$27\ 38^{6}$	18†
10	$26\cdot8^{4}$	$20\ 10^{8}$	8
11	$44\cdot3^{4}$	$22\ 42^{7}$	13
12	$50\cdot0^{4}$	$25\ 10^{7}$	12
13	$56\cdot2^{3}$	$21\ 35^{5}$	36[22]
14	$56\cdot4^{3}$	$24\ 05^{6}$	18

(17) ~35″.
(18) ~15″.
(19) NGC 5236.
(20) ⩽12″.
(21) Superimposed on background irregularity.
(22) >30″.

TABLE 1 (*Continued*)

Ref. No.	Position (1950) R.A. (h m)	Position (1950) Dec. S. (° ′)	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)
	16		
1	01·9^{3}	28 50^{5}	35
2	05·0^{4}	20 21^{6}	20
3	18·2^{5}	23 53^{7}	14
4	19·2^{3}	28 00^{6}	18
5	28·7^{3}	26 50^{6}	27
6	35·9^{6}	23 38^{8}	10 [15]
7	36·6^{4}	21 33^{7}	8
8	39·6^{4}	25 25^{10}	19
9	43·4^{3}	22 22^{5}	22
10	53·3^{4}	25 40^{8}	14
11	53·6^{3}	20 13^{6}	11
12	59·3^{3}	28 43^{7}	25 [15]
	17		
1	01·7^{4}	24 24^{7}	15 [15]
2	08·2^{3}	20 56^{6}	19
3	09·5^{2}	23 18^{5}	42 [23]
4	09·9^{3}	28 00^{7}	24
5	10·8^{2}	25 00^{5}	47 [24]
6	13·2^{4}	29 50^{7}	38
7	17·9^{3}	28 56^{8}	32 [15]
8	22·1^{6}	20 19^{8}	17
9	22·4^{4}	26 50^{6}	18
10	23·0^{5}	28 05^{6}	14† [15]
11	27·8^{1}	21 29^{3}	110 [25]
12	37·0^{4}	21 33^{7}	21
13	43·7^{9}	28 41^{12}	*4500* [26]
14	52·2^{4}	21 30^{7}	*194* (87)
15	52·4^{4}	23 05^{6}	82†
16	57·4^{1}	23 26^{3}	900 [27]
17	59·9^{3}	28 00^{3}	35 [28]
	18		
1	02·7^{1}	21 23^{3}	253 [29]
2	02·8^{4}	26 03^{7}	19 [15]
3	04·0^{2}	20 10^{4}	70
4	05·8^{3}	27 00^{7}	34
5	12·8^{3}	24 09^{5}	*114* (71) [16, 30]
6	14·9^{5}	22 40^{6}	24
7	16·2^{3}	25 45^{6}	30†
8	22·5^{3}	20 05^{7}	*70* (27)
9	23·8^{3}	24 03^{7}	31
10	24·8^{3}	29 10^{6}	26
11	33·6^{3}	23 59^{7}	39
12	48·5^{3}	25 57^{6}	23 [16]
13	50·9^{5}	26 52^{7}	22 [16]
14	53·0^{4}	22 27^{6}	10 [16]
	19		
1	00·1^{3}	23 33^{5}	35†
2	04·0^{3}	25 09^{5}	17
3	12·8^{3}	26 58^{5}	53†
4	13·6^{3}	24 49^{6}	35
5	16·4^{3}	21 41^{7}	18
6	20·4^{3}	20 37^{7}	8
7	25·6^{3}	25 44^{5}	21†
8	29·2^{4}	26 40^{6}	42
9	33·4^{6}	24 08^{6}	9
10	34·9^{3}	22 22^{6}	11
11	42·6^{3}	27 05^{6}	12
12	46·4^{4}	28 01^{6}	18
13	50·4^{4}	21 47^{6}	11

(23) $>30''$.
(24) $\geqslant 40''$.
(25) Kepler's Supernova—size $>45''$.
(26) IAU 17S2A, complex distribution—only the integrated flux is given.
(27) $>65''$.
(28) $\sim 30''$.
(29) $>60''$.
(30) $>40''$.

TABLE 1 (*Continued*)

Ref. No.	Position (1950) R.A. (h m)	Position (1950) Dec. S. (° ′)	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)
	20		
1	$02\cdot8^{3}$	$25\ 03^{6}$	7[15]
2	$15\cdot1^{3}$	$29\ 40^{7}$	11
3	$18\cdot3^{4}$	$22\ 23^{7}$	8
4	$21\cdot1^{4}$	$21\ 11^{5}$	11
5	$24\cdot3^{4}$	$20\ 34^{6}$	9
6	$24\cdot5^{4}$	$21\ 44^{5}$	18
7	$27\cdot4^{3}$	$29\ 40^{7}$	9[15]
8	$29\cdot9^{3}$	$23\ 00^{5}$	22
9	$34\cdot8^{3}$	$24\ 18^{8}$	6
10	$35\cdot7^{3}$	$20\ 16^{7}$	9
11	$38\cdot8^{3}$	$27\ 57^{6}$	12
12	$40\cdot6^{3}$	$26\ 43^{5}$	18†
13	$45\cdot2^{3}$	$24\ 16^{7}$	12
14	$53\cdot0^{3}$	$20\ 07^{5}$	25
15	$58\cdot7^{2}$	$28\ 13^{4}$	59:[31]
16	$59\cdot9^{4}$	$21\ 05^{7}$	8[16]
	21		
1	$04\cdot6^{1}$	$25\ 39^{3}$	100[32]
2	$06\cdot2^{3}$	$23\ 55^{6}$	21†
3	$13\cdot6^{3}$	$21\ 11^{5}$	24
4	$15\cdot3^{3}$	$25\ 07^{6}$	15
5	$18\cdot9^{3}$	$26\ 45^{6}$	17
6	$23\cdot1^{4}$	$23\ 58^{7}$	9
7	$24\cdot9^{3}$	$29\ 24^{7}$	10
8	$26\cdot6^{3}$	$22\ 55^{7}$	9
9	$28\cdot3^{3}$	$20\ 54^{5}$	16
10	$34\cdot7^{3}$	$20\ 57^{6}$	11
11	$36\cdot3^{3}$	$25\ 59^{6}$	15
12	$36\cdot7^{3}$	$27\ 58^{6}$	8
13	$50\cdot0^{4}$	$20\ 03^{7}$	15
14	$50\cdot7^{3}$	$28\ 10^{8}$	12
15	$59\cdot9^{2}$	$28\ 36^{6}$	10
	22		
1	$14\cdot7^{4}$	$28\ 23^{6}$	*23* (14)
2	$16\cdot7^{3}$	$20\ 50^{7}$	11
3	$22\cdot8^{4}$	$27\ 32^{8}$	9
4	$26\cdot5^{3}$	$29\ 30^{7}$	9
5	$32\cdot7^{4}$	$23\ 02^{6}$	9
6	$45\cdot9^{4}$	$24\ 23^{6}$	9
7	$46\cdot5^{4}$	$26\ 53^{7}$	8
8	$47\cdot3^{3}$	$23\ 19^{5}$	13
9	$48\cdot1^{4}$	$22\ 17^{6}$	7
10	$55\cdot3^{3}$	$23\ 01^{5}$	9
11	$59\cdot4^{3}$	$26\ 55^{6}$	8
	23		
1	$03\cdot8^{3}$	$25\ 26^{6}$	13
2	$07\cdot1^{4}$	$28\ 20^{6}$	7
3	$10\cdot9^{4}$	$21\ 57^{6}$	8
4	$17\cdot1^{3}$	$27\ 38^{6}$	23
5	$17\cdot5^{3}$	$22\ 13^{6}$	13
6	$18\cdot1^{3}$	$24\ 25^{5}$	12†
7	$22\cdot9^{3}$	$23\ 20^{6}$	12
8	$26\cdot4^{3}$	$21\ 25^{5}$	20
9	$27\cdot5^{4}$	$25\ 22^{6}$	*27* (16)
10	$42\cdot5^{3}$	$24\ 10^{5}$	10
11	$45\cdot8^{3}$	$28\ 20^{6}$	15
12	$46\cdot7^{3}$	$26\ 25^{7}$	6
13	$47\cdot9^{3}$	$25\ 16^{4}$	16
14	$49\cdot8^{3}$	$23\ 19^{6}$	7
15	$51\cdot9^{3}$	$22\ 25^{6}$	7
16	$55\cdot4^{4}$	$21\ 30^{7}$	11

[31] $\leqslant 20''$.

[32] $> 50''$.

TABLE 2

SOURCES BETWEEN DECLINATIONS —30° AND —40°

Sources which may be " extended ", that is, resolvable, are indicated by a dagger. A colon has been placed beside uncertain flux densities. Angular sizes, where available, are indicated in the footnotes. Details in Section II

Ref. No.	Position (1950) R.A. (h m)	Position (1950) Dec. S. (° ′)	Flux Density (10^{-26} W m^{-2} $(c/s)^{-1}$)
	00		
1	$00\cdot2^{3}$	$31\ 13^{6}$	17
2	$02\cdot7^{4}$	$36\ 50^{8}$	8
3	$06\cdot9^{3}$	$32\ 21^{8}$	14†
4	$09\cdot8^{4}$	$33\ 16^{7}$	12
5	$12\cdot9^{3}$	$38\ 27^{6}$	19
6	$14\cdot1^{3}$	$31\ 28^{4}$	17
7	$14\cdot5^{3}$	$36\ 41^{6}$	7
8	$23\cdot1^{3}$	$33\ 07^{7}$	20
9	$25\cdot3^{4}$	$39\ 21^{6}$	8
10	$32\cdot9^{5}$	$33\ 41^{7}$	9†
11	$33\cdot7^{3}$	$37\ 47^{6}$	9
12	$34\cdot3^{3}$	$30\ 41^{7}$	9
13	$36\cdot2^{2}$	$39\ 24^{5}$	30[1]
14	$37\cdot1^{3}$	$33\ 06^{7}$	11
15	$41\cdot9^{2}$	$35\ 38^{4}$	13
16	$51\cdot6^{3}$	$36\ 38^{5}$	15
17	$53\cdot5^{5}$	$38\ 03^{5}$	12[2]†
	01		
1	$00\cdot6^{3}$	$31\ 36^{6}$	12
2	$03\cdot3^{3}$	$38\ 25^{5}$	9
3	$07\cdot2^{3}$	$37\ 02^{6}$	8
4	$07\cdot3^{3}$	$39\ 20^{6}$	10
5	$07\cdot9^{3}$	$35\ 01^{5}$	*30* (15)[3]
6	$12\cdot2^{4}$	$32\ 30^{7}$	17[4]
7	$12\cdot7^{5}$	$31\ 21^{8}$	10[4]
8	$19\cdot9^{3}$	$37\ 49^{5}$	19
9	$24\cdot7^{3}$	$36\ 41^{7}$	10
10	$30\cdot4^{3}$	$38\ 31^{6}$	10
11	$31\cdot6^{2}$	$36\ 44^{3}$	56†[5]
12	$41\cdot2^{3}$	$39\ 48^{5}$	15[6]
13	$44\cdot3^{3}$	$37\ 31^{7}$	9
14	$54\cdot2^{3}$	$36\ 23^{5}$	16
15	$57\cdot9^{3}$	$31\ 10^{4}$	26[7]
	02		
1	$04\cdot5^{3}$	$37\ 52^{8}$	10
2	$10\cdot0^{4}$	$34\ 31^{5}$	13
3	$16\cdot0^{2}$	$36\ 45^{5}$	29†[8]
4	$18\cdot8^{3}$	$38\ 21^{6}$	19
5	$24\cdot5^{3}$	$30\ 51^{5}$	14
6	$25\cdot0^{3}$	$34\ 05^{6}$	9
7	$38\cdot5^{4}$	$31\ 13^{6}$	8
8	$45\cdot3^{3}$	$35\ 34^{7}$	10
9	$59\cdot5^{3}$	$34\ 36^{6}$	13†
	03		
1	$20\cdot6^{2}$	$37\ 23^{3}$	*950* (825)[9]
2	$32\cdot6^{4}$	$39\ 09^{6}$	10
3	$36\cdot2^{2}$	$35\ 35^{5}$	23[10]
4	$36\cdot7^{3}$	$32\ 01^{4}$	14
5	$42\cdot8^{4}$	$31\ 16^{7}$	11
6	$44\cdot9^{2}$	$34\ 35^{4}$	33[11]
7	$45\cdot7^{4}$	$35\ 18^{7}$	8
8	$55\cdot1^{3}$	$30\ 21^{5}$	12
9	$57\cdot1^{4}$	$37\ 02^{5}$	14

(1) 15′.
(2) NGC 300.
(3) Perhaps several sources.
(4) Sources 01–*36*, 01–*37* perhaps form one extended source.
(5) >45′.
(6) A doubtful source.
(7) <15′.
(8) ⩾40′.
(9) Fornax A ; IAU 03S3A. NGC 1316 (NGC 1317).
(10) NGC 1399 (NGC 1404).
(11) >45′.

TABLE 2 (*Continued*)

Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)	Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)
	04				06		
1	$05{\cdot}3^{3}$	$32\ 06^{7}$	11	*1*	$01{\cdot}1^{2}$	$34\ 27^{4}$	22
2	$06{\cdot}3^{3}$	$31\ 11^{6}$	12†	*2*	$02{\cdot}2^{3}$	$32\ 20^{8}$	17†
3	$10{\cdot}6^{2}$	$34\ 33^{4}$	16	*3*	$02{\cdot}4^{3}$	$35\ 24^{8}$	9
4	$19{\cdot}8^{5}$	$31\ 01^{8}$	6	*4*	$07{\cdot}8^{4}$	$30\ 46^{7}$	8
5	$20{\cdot}5^{2}$	$33\ 26^{6}$	12†	*5*	$14{\cdot}3^{4}$	$39\ 32^{7}$	8
6	$27{\cdot}1^{2}$	$36\ 38^{4}$	35[12]	*6*	$14{\cdot}3^{4}$	$35\ 06^{8}$	7
7	$31{\cdot}1^{3}$	$39\ 57^{6}$	14	*7*	$17{\cdot}9^{2}$	$37\ 11^{5}$	18
8	$37{\cdot}8^{3}$	$31\ 09^{6}$	10	*8*	$25{\cdot}5^{2}$	$35\ 26^{4}$	26
9	$38{\cdot}5^{4}$	$36\ 11^{6}$	8	*9*	$30{\cdot}7^{4}$	$36\ 38^{6}$	13†
10	$41{\cdot}3^{4}$	$34\ 45^{8}$	6	*10*	$31{\cdot}1^{4}$	$39\ 16^{6}$	8
11	$43{\cdot}8^{2}$	$33\ 00^{6}$	8	*11*	$40{\cdot}7^{3}$	$36\ 05^{8}$	7
12	$45{\cdot}0^{5}$	$39\ 12^{6}$	18	*12*	$46{\cdot}7^{2}$	$39\ 56^{4}$	26
13	$46{\cdot}4^{3}$	$35\ 53^{6}$	10	*13*	$50{\cdot}2^{3}$	$34\ 19^{6}$	9
14	$54{\cdot}5^{2}$	$30\ 16^{5}$	*78* (43)[13]	*14*	$50{\cdot}2^{3}$	$32\ 40^{8}$	9
15	$55{\cdot}4^{3}$	$31\ 58^{7}$	9	*15*	$58{\cdot}8^{4}$	$34\ 34^{8}$	5
	05				07		
1	$03{\cdot}8^{4}$	$38\ 55^{7}$	8	*1*	$00{\cdot}0^{3}$	$31\ 33^{7}$	14†
2	$04{\cdot}6^{4}$	$37\ 51^{7}$	13	*2*	$00{\cdot}9^{4}$	$33\ 34^{10}$	11
3	$04{\cdot}6^{4}$	$32\ 21^{8}$	6[14]	*3*	$06{\cdot}0^{4}$	$39\ 58^{6}$	12
4	$04{\cdot}9^{2}$	$37\ 01^{6}$	7[6]	*4*	$07{\cdot}6^{3}$	$35\ 53^{6}$	15
5	$11{\cdot}5^{2}$	$30\ 34^{5}$	29	*5*	$15{\cdot}3^{3}$	$36\ 27^{5}$	18†
6	$21{\cdot}4^{3}$	$36\ 24^{6}$	66:[15]	*6*	$17{\cdot}2^{4}$	$31\ 40^{8}$	9
7	$22{\cdot}9^{3}$	$32\ 48^{6}$	18	*7*	$18{\cdot}9^{2}$	$34\ 15^{7}$	18[17]
8	$24{\cdot}9^{3}$	$30\ 55^{7}$	8	*8*	$19{\cdot}0^{3}$	$35\ 01^{8}$	9[17]
9	$34{\cdot}2^{3}$	$37\ 23^{7}$	9	*9*	$25{\cdot}8^{3}$	$35\ 40^{7}$	9
10	$38{\cdot}1^{3}$	$33\ 40^{10}$	*30* (16)[16]	*10*	$27{\cdot}6^{3}$	$30\ 10^{8}$	8
11	$41{\cdot}9^{3}$	$38\ 42^{8}$	8	*11*	$29{\cdot}7^{4}$	$32\ 03^{7}$	14
12	$45{\cdot}8^{4}$	$30\ 01^{8}$	7	*12*	$35{\cdot}8^{3}$	$37\ 59^{5}$	21[18]
13	$46{\cdot}3^{3}$	$33\ 04^{6}$	14[16]	*13*	$36{\cdot}0^{3}$	$30\ 21^{6}$	19
14	$50{\cdot}0^{3}$	$35\ 06^{6}$	13	*14*	$37{\cdot}9^{3}$	$36\ 20^{7}$	11†
15	$52{\cdot}0^{4}$	$36\ 31^{7}$	10[6]	*15*	$49{\cdot}4^{4}$	$38\ 45^{8}$	*24* (13)
16	$54{\cdot}3^{3}$	$32\ 14^{7}$	14	*16*	$50{\cdot}3^{4}$	$35\ 06^{8}$	8†
17	$58{\cdot}2^{5}$	$31\ 01^{8}$	9	*17*	$51{\cdot}8^{3}$	$31\ 06^{8}$	9[19]
18	$59{\cdot}3^{2}$	$38\ 40^{7}$	16	*18*	$53{\cdot}8^{4}$	$35\ 40^{8}$	7
19	$59{\cdot}8^{2}$	$39\ 49^{5}$	20	*19*	$55{\cdot}0^{4}$	$30\ 21^{8}$	15[19]

[12] $\leqslant 10''$.
[13] Perhaps two sources.
[14] (NGC 1800).
[15] $20''$.
[16] Sources 05–3*10*, 05–3*13* perhaps form one extended source.
[17] Sources 07–3*7*, 07–3*8* perhaps form one extended source.
[18] Perhaps extended or superimposed on galactic emission feature.
[19] Sources 07–3*17*, 07–3*19* perhaps form one extended source.

TABLE 2 (*Continued*)

Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)
	08		
1	07·6^2	38 50^5	*38* (19)
2	25·5^4	31 42^7	19[20]
3	27·2^3	30 31^4	20
4	28·5^5	32 51^7	*30* (20)[21]
5	32·3^2	34 21^6	10
6	40·8^3	39 42^8	17
7	43·0^3	30 39^6	12[22]
8	43·0^3	33 39^6	17
9	45·4^4	35 43^7	8†
10	48·1^3	34 38^6	9†
11	50·5^3	33 40^7	11
12	51·8^4	31 50^8	9
13	59·8^4	34 30^8	6
	09		
1	01·9^3	36 48^7	15
2	02·6^3	38 34^6	25†
3	21·0^6	32 11^7	9:
4	21·1^2	39 56^5	9
5	34·7^4	32 25^8	14
6	38·8^3	39 16^6	8
7	41·5^3	30 25^7	8
8	42·3^3	35 40^7	8
9	44·0^4	33 00^6	8
10	45·3^2	36 51^6	11
11	50·0^3	38 35^{10}	*25* (12)
12	51·4^3	39 26^7	17
	10		
1	02·2^3	36 58^7	9[23]
2	03·5^4	32 30^8	14
3	11·5^4	31 45^8	10
4	14·3^3	30 08^6	11
5	16·5^4	31 31^7	14
6	17·7^3	32 48^6	19†
7	29·3^2	35 58^6	*25* (15)
8	30·8^2	34 09^6	20
9	35·2^4	39 50^7	6
10	43·9^3	38 00^6	7
11	45·1^3	35 54^5	9
12	51·7^3	34 03^6	12†
13	52·3^3	37 26^5	*18* (12)
14	56·3^2	35 52^5	12
15	59·5^3	31 00^7	10
	11		
1	00·3^3	32 10^8	8
2	23·0^4	37 00^8	7
3	23·5^3	35 12^6	17
4	25·8^3	32 18^6	10†
5	27·1^2	34 20^7	11
6	35·1^4	39 02^6	11
7	35·5^4	36 55^8	8
8	36·0^3	31 58^6	28
9	43·4^4	35 20^6	9[24]
10	43·5^2	31 41^6	27
11	44·1^3	33 14^6	16
12	46·5^3	37 58^7	11
13	48·7^4	35 40^8	8[24]
14	50·8^2	34 49^6	10[24]
15	55·5^3	31 30^6	13
	12		
1	01·2^3	35 37^6	13†
2	05·4^3	33 43^7	17
3	18·4^3	36 56^7	14†
4	32·3^3	33 28^7	22†
5	40·2^3	38 40^6	11†
6	41·8^5	36 00^{10}	6
7	43·2^3	35 00^{10}	7
8	54·2^3	30 09^5	28
9	56·2^3	33 14^6	18
10	59·6^3	36 54^6	14
	13		
1	05·3^5	30 03^7	12
2	09·0^4	36 51^7	9
3	33·9^2	33 42^5	70[25]
4	46·9^4	39 00^7	22
5	59·1^4	32 45^8	8[6]

[20] Perhaps part of 08–3*4*.
[21] Extended parallel to galactic plane.
[22] Perhaps one extended source with 08–2*13*.
[23] Perhaps a background irregularity.
[24] Sources 11–3*9*, 11–3*13*, 11–3*14* perhaps form one extended source.
[25] $>50''$, I4296.

TABLE 2 (*Continued*)

Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)
	14		
1	$00{\cdot}6^3$	$36\ 16^6$	20
2	$01{\cdot}5^3$	$33\ 53^4$	57[26]
3	$18{\cdot}8^3$	$30\ 55^7$	17
4	$21{\cdot}7^3$	$38\ 10^7$	20
5	$28{\cdot}1^3$	$31\ 53^5$	16
6	$29{\cdot}6^3$	$34\ 54^6$	12[6]
7	$40{\cdot}3^3$	$30\ 28^6$	14†
8	$51{\cdot}3^2$	$36\ 22^4$	41
9	$51{\cdot}4^3$	$34\ 10^7$	19
	15		
1	$04{\cdot}2^3$	$39\ 22^6$	14
2	$07{\cdot}4^3$	$30\ 30^7$	9[6]
3	$17{\cdot}6^3$	$39\ 36^6$	10
4	$22{\cdot}4^3$	$37\ 20^7$	14
5	$30{\cdot}8^3$	$31\ 21^6$	12[23]
6	$40{\cdot}9^3$	$38\ 37^6$	21:[23]
7	$53{\cdot}8^4$	$35\ 56^7$	10
	16		
1	$04{\cdot}9^4$	$32\ 46^7$	19[6]
2	$10{\cdot}9^3$	$39\ 24^6$	*56* (28)[6]
3	$17{\cdot}5^3$	$36\ 40^8$	13
4	$20{\cdot}0^3$	$34\ 30^8$	13
5	$22{\cdot}4^3$	$32\ 05^6$	24
6	$22{\cdot}5^3$	$30\ 36^7$	29†
7	$26{\cdot}6^5$	$35\ 09^7$	11
8	$57{\cdot}8^3$	$33\ 57^8$	19
	17		
1	$02{\cdot}1^3$	$31\ 54^6$	32
2	$06{\cdot}6^4$	$37\ 10^5$	100†
3	$11{\cdot}1^2$	$38\ 23^4$	*500* (300)
4	$19{\cdot}8^3$	$35\ 40^5$	75[27]
5	$21{\cdot}8^5$	$38\ 14^7$	75†
	17		
6	$26{\cdot}2^3$	$34\ 45^5$	60
7	$26{\cdot}7^2$	$34\ 02^4$	120
8	$28{\cdot}3^2$	$32\ 43^5$	95
9	$36{\cdot}6^2$	$30\ 50^5$	165
10	$39{\cdot}9^3$	$36\ 01^6$	31†
	18		
1	$03{\cdot}7^3$	$36\ 20^6$	9
2	$06{\cdot}9^3$	$39\ 52^5$	9
3	$17{\cdot}8^3$	$39\ 11^5$	41[28]
4	$26{\cdot}1^3$	$38\ 11^5$	18
5	$35{\cdot}2^3$	$31\ 51^7$	19
6	$37{\cdot}7^3$	$36\ 17^6$	12[29]
7	$48{\cdot}6^3$	$33\ 26^5$	15
8	$49{\cdot}4^3$	$34\ 41^4$	17[6]
9	$58{\cdot}6^4$	$38\ 24^6$	12
	19		
1	$12{\cdot}8^3$	$37\ 03^7$	18
2	$16{\cdot}9^3$	$35\ 44^6$	16
3	$27{\cdot}0^3$	$36\ 06^5$	16
4	$37{\cdot}1^3$	$36\ 11^5$	13
5	$56{\cdot}4^3$	$35\ 49^4$	45[30]
	20		
1	$04{\cdot}5^4$	$39\ 00^8$	17†[31]
2	$13{\cdot}5^3$	$36\ 05^7$	17
3	$13{\cdot}9^4$	$31\ 44^6$	10
4	$14{\cdot}0^3$	$31\ 00^7$	15†
5	$24{\cdot}4^4$	$32\ 01^5$	18
6	$29{\cdot}8^3$	$37\ 40^6$	7
7	$32{\cdot}3^2$	$35\ 04^5$	41[32]
8	$48{\cdot}0^3$	$37\ 07^6$	19†
9	$56{\cdot}2^3$	$33\ 00^7$	9

(26) $>45''$ (NGC 5419).
(27) $>45''$.
(28) $<20''$.
(29) Superimposed on background irregularity.
(30) Flux measurement uncertain due to Cygnus A side lobe $\sim20''$.
(31) A doubtful source, perhaps extended or a background irregularity.
(32) $<10''$.

TABLE 2 (*Continued*)

Ref. No.	Position (1950) R.A. (h m)	Position (1950) Dec. S. (° ′)	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)
	21		
1	$00\cdot3^{3}$	$39\ 37^{7}$	12
2	$07\cdot9^{3}$	$34\ 04^{7}$	14
3	$10\cdot4^{4}$	$35\ 10^{8}$	8
4	$14\cdot6^{3}$	$30\ 36^{6}$	15
5	$16\cdot0^{4}$	$33\ 35^{7}$	8
6	$28\cdot1^{3}$	$31\ 22^{5}$	13
7	$45\cdot5^{3}$	$30\ 23^{6}$	14
8	$57\cdot3^{4}$	$38\ 04^{6}$	11[(6)]
	22		
1	$15\cdot1^{4}$	$30\ 45^{7}$	8
2	$24\cdot8^{3}$	$30\ 46^{5}$	10
3	$43\cdot4^{3}$	$30\ 42^{5}$	12
4	$48\cdot4^{3}$	$33\ 21^{6}$	9
5	$59\cdot0^{2}$	$37\ 33^{5}$	21
	23		
1	$10\cdot8^{3}$	$32\ 26^{7}$	13
2	$13\cdot3^{3}$	$34\ 31^{7}$	9
3	$34\cdot2^{3}$	$32\ 56^{6}$	16
4	$34\cdot3^{4}$	$34\ 58^{6}$	24
5	$34\cdot3^{3}$	$37\ 38^{6}$	7[(6)]
6	$48\cdot0^{3}$	$38\ 39^{6}$	11
7	$54\cdot6^{2}$	$34\ 59^{4}$	39[(33)]
8	$59\cdot9^{3}$	$36\ 08^{5}$	18

[(33)] $>40''$.

TABLE 3

SOURCES BETWEEN DECLINATIONS —40° AND —50°

Sources which may be " extended ", that is, resolvable, are indicated by a dagger. A colon has been placed beside uncertain flux densities. Angular sizes, where available, are indicated in the footnotes. Details in Section II

Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)
	00		
1	01·6^{3}	48 23^{6}	10
2	03·8^{3}	42 50^{6}	17
3	08·2^{2}	44 40^{4}	*60* (31)[1]
4	17·2^{3}	41 19^{5}	13
5	17·8^{3}	49 27^{6}	9
6	19·1^{3}	47 17^{5}	13
7	32·7^{4}	45 33^{6}	9
8	34·2^{3}	49 12^{6}	8
9	36·6^{4}	41 16^{7}	7[2]
10	39·8^{2}	44 37^{4}	35[3]
11	43·7^{2}	42 25^{4}	52[4]
12	44·0^{4}	49 57^{6}	6
13	48·8^{4}	44 46^{7}	16
14	50·1^{4}	43 23^{5}	23
15	52·9^{3}	49 27^{6}	9
	01		
1	03·2^{2}	45 22^{5}	41[5]
2	03·6^{3}	41 29^{4}	*25* (17)
3	07·4^{4}	48 12^{8}	5
4	12·9^{4}	44 46^{8}	8
5	14·0^{3}	47 34^{5}	34[6]
6	15·7^{3}	41 06^{6}	8[2]
7	24·3^{4}	43 25^{7}	8
8	25·2^{2}	41 17^{6}	33†
9	31·4^{3}	44 56^{8}	18
10	39·5^{3}	44 40^{7}	9
11	39·8^{4}	45 51^{8}	10
12	40·5^{4}	43 58^{7}	14
13	52·3^{3}	43 46^{6}	10
	02		
1	01·9^{3}	44 02^{5}	9
2	07·2^{4}	42 00^{5}	16
3	14·0^{3}	48 03^{5}	*65* (31)[7]
4	19·7^{2}	45 33^{5}	11†
5	22·6^{3}	42 03^{7}	17
6	24·2^{4}	43 15^{8}	7
7	27·4^{3}	40 14^{7}	*24* (14)[8]
8	30·5^{2}	41 22^{5}	7
9	34·6^{3}	43 49^{6}	8
10	40·2^{3}	42 03^{7}	12
11	43·5^{3}	45 07^{5}	10
12	55·0^{3}	44 05^{7}	7
13	55·3^{4}	48 49^{5}	16†
	03		
1	03·5^{2}	46 42^{7}	8
2	15·6^{3}	44 00^{6}	10
3	18·8^{3}	45 20^{7}	19[9]
4	35·5^{3}	41 28^{5}	14
5	38·4^{3}	40 37^{6}	10[2]
6	38·5^{3}	47 46^{5}	13
7	42·0^{2}	44 20^{6}	11
8	43·6^{4}	45 46^{7}	9
9	51·2^{3}	41 23^{5}	9
10	53·0^{3}	43 04^{8}	8
11	54·1^{3}	48 24^{4}	14

(1) Perhaps two sources.
(2) A doubtful source.
(3) $<15''$.
(4) $>40''$.
(5) $23''$.
(6) $>40''$.
(7) $>40''$.
(8) Perhaps several sources.
(9) Measurement subject to side-lobe influence of IAU 03S3A.

TABLE 3 (*Continued*)

Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)
	04		
1	08·2^{4}	47 06^{8}	9[10]
2	13·9^{3}	42 44^{6}	17
3	18·1^{3}	40 08^{6}	11
4	18·2^{3}	41 35^{8}	11
5	25·1^{3}	49 06^{6}	8
6	34·2^{3}	49 50^{7}	12
7	36·5^{3}	47 36^{6}	13
8	37·8^{3}	45 00^{6}	9
9	38·2^{3}	43 31^{5}	12
10	55·4^{3}	40 30^{5}	13
11	55·6^{3}	43 06^{6}	12
12	55·6^{3}	46 20^{7}	9[2]
	05		
1	02·0^{5}	41 50^{7}	7
2	11·9^{4}	48 32^{5}	41[11]
3	18·3^{1}	45 48^{3}	570[12]
4	25·8^{3}	40 56^{7}	14
5	31·5^{3}	45 40^{8}	19[2]
6	34·8^{3}	49 46^{6}	16
7	45·2^{3}	48 17^{5}	15
8	46·2^{3}	44 35^{6}	13
9	46·2^{4}	45 57^{6}	17
10	47·8^{2}	40 52^{4}	31†[13]
11	47·8^{4}	42 03^{8}	7
	06		
1	06·1^{3}	49 38^{7}	15†
2	07·3^{4}	42 27^{8}	9
3	12·2^{3}	47 18^{6}	27
4	16·6^{3}	48 44^{5}	9
5	19·8^{3}	45 07^{6}	12
6	20·1^{4}	47 00^{7}	7
7	27·5^{3}	41 58^{5}	12[2]
8	29·7^{3}	43 49^{7}	9
9	34·2^{5}	41 15^{8}	7
10	37·0^{5}	49 27^{8}	8
11	40·8^{4}	46 06^{8}	7[2]
12	43·0^{3}	43 55^{8}	13
13	35·0^{4}	41 53^{8}	7
	07		
1	00·1^{3}	47 30^{7}	18
2	02·5^{3}	45 22^{5}	25
3	04·3^{3}	42 46^{6}	19
4	05·3^{4}	41 08^{5}	10
5	08·8^{5}	48 26^{7}	8[2]
6	10·6^{4}	46 22^{8}	8
7	28·1^{4}	48 09^{6}	8
8	29·8^{4}	46 45^{6}	9
9	33·7^{4}	44 07^{7}	11†
10	35·0^{3}	48 56^{7}	12
11	47·3^{3}	40 36^{5}	12
12	48·1^{3}	44 00^{7}	27[14]
13	48·1^{4}	45 36^{7}	12
14	51·2^{4}	43 04^{7}	18[14]
	08		
1	09·4^{3}	49 38^{7}	27
2	09·8^{3}	43 05^{7}	10
3	16·1^{3}	47 07^{7}	10[2]
4	20·9^{3}	42 52^{4}	*690* (514)[15]
5	33·7^{2}	45 38^{5}	*1100* (276)[16]
6	54·9^{4}	41 25^{7}	10†
7	57·6^{2}	47 25^{7}	26†
8	59·3^{3}	43 26^{6}	17

[10] Perhaps extended or several sources.
[11] $\leqslant 20''$.
[12] Pictor A ; IAU 05S4A 55″.
[13] $> 30''$.
[14] Sources 07–4*12*, 07–4*14* perhaps form one extended source.
[15] Puppis A ; IAU 08S4A.
[16] $> 55''$.

TABLE 3 (*Continued*)

Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)
	09		
1	$06{\cdot}9^{4}$	$46\ 37^{8}$	7
2	$09{\cdot}7^{3}$	$45\ 07^{6}$	11
3	$12{\cdot}6^{3}$	$43\ 34^{7}$	8†[2]
4	$27{\cdot}0^{4}$	$46\ 42^{8}$	8
5	$27{\cdot}8^{5}$	$45\ 14^{7}$	7
6	$43{\cdot}2^{4}$	$49\ 53^{7}$	9
7	$46{\cdot}4^{3}$	$41\ 22^{7}$	12†
8	$49{\cdot}3^{5}$	$46\ 50^{8}$	*15*[8]
9	$51{\cdot}8^{4}$	$45\ 16^{7}$	15
10	$51{\cdot}9^{3}$	$43\ 27^{6}$	12
	10		
1	$02{\cdot}9^{4}$	$49\ 44^{6}$	9†
2	$03{\cdot}3^{3}$	$46\ 27^{5}$	8
3	$14{\cdot}9^{4}$	$44\ 25^{7}$	9
4	$17{\cdot}9^{3}$	$42\ 26^{3}$	51[17]
5	$19{\cdot}1^{4}$	$45\ 48^{7}$	10
6	$19{\cdot}2^{4}$	$49\ 22^{7}$	10
7	$24{\cdot}7^{4}$	$40\ 57^{5}$	13
8	$25{\cdot}8^{4}$	$47\ 52^{8}$	8
9	$26{\cdot}4^{3}$	$45\ 00^{7}$	8
10	$32{\cdot}2^{5}$	$41\ 17^{8}$	12†
11	$39{\cdot}3^{4}$	$46\ 05^{6}$	13
12	$46{\cdot}4^{4}$	$49\ 15^{7}$	8
13	$52{\cdot}2^{4}$	$40\ 00^{7}$	6
	11		
1	$04{\cdot}4^{3}$	$41\ 56^{6}$	9
2	$06{\cdot}7^{3}$	$48\ 23^{7}$	11
3	$16{\cdot}1^{3}$	$43\ 24^{7}$	13
4	$23{\cdot}0^{4}$	$48\ 13^{6}$	*53* (19)
5	$33{\cdot}9^{3}$	$43\ 15^{7}$	14
6	$43{\cdot}3^{3}$	$48\ 20^{6}$	28
7	$49{\cdot}1^{3}$	$44\ 56^{7}$	21[2]
8	$55{\cdot}5^{3}$	$42\ 16^{7}$	13
	12		
1	$10{\cdot}7^{4}$	$41\ 43^{7}$	18
2	$11{\cdot}5^{3}$	$44\ 56^{6}$	8
3	$16{\cdot}2^{4}$	$46\ 01^{7}$	19†
4	$33{\cdot}7^{4}$	$41\ 25^{7}$	11
5	$46{\cdot}8^{3}$	$40\ 56^{5}$	45[18]
6	$51{\cdot}9^{2}$	$47\ 43^{5}$	14:†
7	$55{\cdot}7^{3}$	$41\ 33^{8}$	16
	13		
1	$02{\cdot}6^{5}$	$49\ 07^{7}$	20[19]
2	$22{\cdot}4^{2}$	$42\ 41^{4}$	*8700* (2170)[20]
3	$38{\cdot}3^{3}$	$40\ 32^{7}$	9
4	$47{\cdot}1^{4}$	$45\ 36^{7}$	*100* (32)[21]
5	$56{\cdot}0^{2}$	$41\ 38^{4}$	35:
	14		
1	$08{\cdot}9^{3}$	$41\ 33^{6}$	14
2	$12{\cdot}6^{3}$	$43\ 23^{6}$	38†[2]
3	$14{\cdot}4^{4}$	$47\ 23^{7}$	14
4	$17{\cdot}6^{4}$	$49\ 44^{7}$	16†
5	$25{\cdot}2^{3}$	$43\ 07^{5}$	*90*: (30)[22]
6	$25{\cdot}7^{3}$	$47\ 48^{6}$	29
7	$32{\cdot}9^{4}$	$45\ 05^{6}$	10
8	$42{\cdot}4^{3}$	$42\ 13^{8}$	15
9	$45{\cdot}0^{3}$	$46\ 57^{5}$	33
10	$45{\cdot}1^{4}$	$48\ 09^{6}$	10
11	$47{\cdot}0^{3}$	$40\ 18^{6}$	14
12	$50{\cdot}0^{3}$	$41\ 00^{7}$	9
13	$51{\cdot}3^{3}$	$42\ 17^{6}$	19[2]
14	$57{\cdot}5^{2}$	$48\ 04^{6}$	17†
15	$59{\cdot}9^{2}$	$41\ 42^{5}$	55:
	15		
1	$04{\cdot}4^{3}$	$42\ 54^{7}$	14†
2	$07{\cdot}6^{4}$	$43\ 56^{8}$	14
3	$27{\cdot}4^{2}$	$42\ 21^{5}$	100
4	$32{\cdot}4^{5}$	$49\ 44^{8}$	21†
5	$38{\cdot}7^{3}$	$40\ 42^{7}$	18
6	$41{\cdot}2^{3}$	$48\ 04^{7}$	*47* (25)
7	$45{\cdot}9^{4}$	$45\ 04^{6}$	24[2]
8	$55{\cdot}3^{3}$	$46\ 12^{7}$	50†[23]

(17) ~30″ IAU 10S4A.
(18) <15″ (NGC 4696).
(19) NGC 4945.
(20) Centaurus A ; IAU 13S4A. NGC 5128.
(21) Possibly a galactic feature.
(22) Perhaps several sources, the interpretation is doubtful.
(23) >30″.

TABLE 3 (*Continued*)

Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} $(c/s)^{-1}$)
	16		
1	$03\cdot0^{3}$	$44\ 25^{8}$	19[2]
2	$17\cdot4^{4}$	$45\ 51^{7}$	26:[24]
3	$19\cdot9^{4}$	$49\ 28^{7}$	76[25]
4	$24\cdot9^{4}$	$48\ 40^{7}$	64
5	$25\cdot1^{4}$	$42\ 10^{8}$	30†
6	$33\cdot2^{3}$	$40\ 32^{7}$	25[2]
7	$36\cdot3^{3}$	$46\ 31^{4}$	330[26]
8	$51\cdot1^{3}$	$44\ 00^{6}$	55†
9	$52\cdot1^{4}$	$42\ 25^{6}$	32
10	$57\cdot6^{5}$	$46\ 22^{8}$	30:
11	$59\cdot0^{4}$	$41\ 18^{5}$	*90* (70)
	17		
1	$03\cdot8^{3}$	$44\ 24^{6}$	25
2	$10\cdot4^{3}$	$45\ 36^{7}$	35
3	$14\cdot4^{3}$	$44\ 00^{7}$	18†
4	$14\cdot8^{3}$	$48\ 20^{7}$	25
5	$16\cdot6^{3}$	$49\ 33^{7}$	29
6	$17\cdot1^{4}$	$46\ 47^{8}$	18
7	$31\cdot3^{3}$	$48\ 31^{8}$	12†
8	$54\cdot4^{3}$	$41\ 33^{7}$	30†
	18		
1	$04\cdot6^{5}$	$45\ 28^{6}$	*77* (45)
2	$12\cdot8^{5}$	$48\ 20^{7}$	16:
3	$39\cdot8^{2}$	$48\ 36^{5}$	41[27]
4	$40\cdot9^{3}$	$40\ 27^{7}$	22
5	$43\cdot9^{3}$	$49\ 49^{7}$	12
6	$44\cdot6^{5}$	$43\ 06^{7}$	8
7	$53\cdot2^{4}$	$43\ 00^{8}$	7
8	$59\cdot6^{3}$	$41\ 25^{5}$	13
	19		
1	$12\cdot0^{3}$	$46\ 28^{6}$	11
2	$13\cdot9^{3}$	$45\ 39^{5}$	13
3	$21\cdot7^{3}$	$43\ 01^{6}$	17
4	$25\cdot2^{3}$	$41\ 23^{7}$	17
5	$31\cdot8^{3}$	$49\ 53^{5}$	9
6	$32\cdot6^{2}$	$46\ 25^{3}$	141[28]
7	$32\cdot9^{3}$	$48\ 31^{7}$	8
8	$35\cdot4^{3}$	$42\ 34^{7}$	8
9	$36\cdot7^{4}$	$48\ 01^{6}$	7
10	$40\cdot4^{3}$	$40\ 41^{6}$	38†[29]
11	$45\cdot6^{3}$	$47\ 08^{5}$	11
12	$51\cdot7^{3}$	$49\ 59^{6}$	14
13	$53\cdot0^{3}$	$42\ 38^{5}$	31†
	20		
1	$03\cdot5^{3}$	$47\ 40^{6}$	9
2	$05\cdot8^{3}$	$42\ 37^{6}$	15†
3	$17\cdot6^{5}$	$42\ 23^{8}$	9
4	$20\cdot5^{4}$	$49\ 53^{7}$	8
5	$27\cdot3^{3}$	$41\ 30^{6}$	22
6	$28\cdot9^{3}$	$45\ 23^{4}$	10
7	$37\cdot3^{3}$	$47\ 52^{6}$	11
8	$43\cdot9^{4}$	$43\ 37^{6}$	16
9	$47\cdot0^{5}$	$44\ 48^{5}$	13
10	$51\cdot4^{3}$	$48\ 22^{6}$	12
	21		
1	$09\cdot4^{4}$	$43\ 12^{6}$	15
2	$10\cdot2^{4}$	$45\ 26^{6}$	7
3	$16\cdot9^{4}$	$47\ 50^{6}$	7
4	$22\cdot3^{4}$	$44\ 56^{7}$	7
5	$27\cdot7^{3}$	$48\ 25^{6}$	10
6	$37\cdot1^{5}$	$44\ 26^{4}$	10
7	$40\cdot3^{2}$	$43\ 21^{4}$	37[30]
8	$50\cdot5^{3}$	$46\ 39^{6}$	14

(24) Possibly a background irregularity.
(25) $>45''$.
(26) $>45''$.
(27) $>30''$.
(28) $18''$.
(29) $>30''$.
(30) $>40''$.

TABLE 3 (*Continued*)

Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)	Ref. No.	Position (1950) R.A. h m	Position (1950) Dec. S. ° ′	Flux Density (10^{-26} W m^{-2} (c/s)$^{-1}$)
	22				23		
1	$06\cdot8^{4}$	$49\ 57^{6}$	8	*1*	$07\cdot8^{3}$	$48\ 42^{7}$	11:
2	$06\cdot8^{3}$	$43\ 59^{6}$	13	*2*	$10\cdot3^{3}$	$44\ 43^{7}$	10
3	$25\cdot3^{3}$	$40\ 56^{5}$	28	*3*	$24\cdot2^{3}$	$40\ 34^{5}$	15
4	$35\cdot0^{5}$	$43\ 44^{8}$	6	*4*	$31\cdot9^{2}$	$41\ 42^{4}$	50(32)
5	$44\cdot1^{4}$	$44\ 26^{7}$	6:	*5*	$39\cdot0^{3}$	$44\ 50^{7}$	6
6	$50\cdot1^{2}$	$41\ 10^{5}$	42(31)	*6*	$42\cdot9^{3}$	$47\ 25^{8}$	9
7	$56\cdot8^{3}$	$41\ 09^{6}$	14	*7*	$49\cdot7^{5}$	$43\ 24^{8}$	8
8	$57\cdot0^{3}$	$46\ 09^{5}$	10	*8*	$51\cdot7^{3}$	$45\ 26^{7}$	7(24)

(31) 30″.
(32) 26″.

although we had available a number of " non-scanning " records of high sensitivity not available to Rishbeth. His catalogue is valuable in that it is based on the contour diagram, gives information about the shapes of some extended sources, and includes several large concentrations not included in our cataloguing scheme. There are, however, often large discordances in the flux densities of weaker sources.

III. IDENTIFICATIONS

A search for identifications with bright optical objects has been carried out as in papers I and II; the atlas of Becvar (1951) has again been used in this search. Some of the area, north of declination —33°, is included in the National Geographic Society-Palomar Observatory Sky Atlas. The previous catalogue and a small portion of the present one has been compared with this Atlas in a systematic way (Mills 1960) and no doubt a similar comparison of the remaining common area will prove interesting, but it is outside the scope of the present paper.

In contrast to the earlier work, no H II regions can be unambiguously identified in the present catalogue; this arises partly as a result of their uneven distribution and partly because the zone of the catalogue crosses the galactic plane, in one of the two places, close to the galactic centre. Here the background temperature is of the same order or higher than the electron temperatures in the nebulae so that, if they are observed at all, they appear as " holes " in the background emission: some of these are listed elsewhere (Mills 1959). Coincidences with planetary nebulae and globular clusters are again not significant: there is a moderately close coincidence between the radio source 17—*21* and the globular cluster NGC 6284, but this would be expected by chance. Two other identifications with galactic objects are well known. These are Kepler's supernova, identified with 17—*211* (Mills, Little, and Sheridan 1956), and

08—*44* (Puppis A) identified by Baade and Minkowski (1954) with a galactic nebulosity of a peculiar filamentary type.

There are numerous possible identifications with bright galaxies in the catalogue. Those listed include all coincidences within 1^{m} in Right Ascension and 20′ in declination ; there are 14 such coincidences and the chance expectation, based on the numbers of catalogued galaxies and radio sources in the area, is about 6. To reduce effects of chance we restrict attention to these coincidences within $0^{\mathrm{m}}{\cdot}7$ in Right Ascension and 13′ in declination, as in paper II (these numbers represent approximately twice the mean probable error in each coordinate). There are 10 such coincidences with 3 expected by chance, but since 5 of these were previously known the new information is not great. They are listed in Table 4.

Table 4

POSSIBLE IDENTIFICATIONS WITH BRIGHT GALAXIES

Radio Source	Galaxy		$m_{1\cdot 9}-m_p$	Notes
	NGC	Type		
00—*221*	253	Sc	1·2	
03—*31*	1316	Sa_p	—4·6	Fornax A
03—*31*	1317	SBb	—6·6	Probably a chance coincidence
03—*33*	1399	Eo	—1·6	
06—*25*	2217	SBb	—0·5	
12—*46*	4696	E1	—3·1	The angular size of the radio source is small. Probably a chance coincidence
13—*41*	4945	SBc	1·3	
13—*42*	5128	Ep	—3·9	Centaurus A, a well-known identification
13—*33*	I4296	E	—4·1	The radio size supports the identification
13—*25*	5236	Sc	0·9	

Of the previously known systems we have three " normal " galaxies NGC 253, NGC 4945, and NGC 5236, and two " radio " galaxies NGC 1316 and NGC 5128. Two of the coincidences can almost certainly be ascribed to chance, NGC 1317 and NGC 4696. In the former, the radio source is, by virtue of its position and size, almost certainly associated with the neighbouring galaxy NGC 1316 ; it would be a remarkable coincidence if NGC 1317 also were contributing to the radio emission. In the case of NGC 4696, which has been noted also by Basinki, Bok, and Gottlieb (1959), the angular size, <15″ arc, appears too small. There are numerous fainter galaxies in the vicinity ; but it appears most likely that the radio source is considerably more distant than any of those visible on the plate of Basinki, Bok, and Gottlieb. The galaxies NGC 1316 and NGC 5128 have been discussed extensively in the literature and will not be considered further in this paper (for the most recent results see Sheridan (1958) and Wade (1959)).

It is interesting to see whether the above coincidences might be expected assuming a radio " luminosity function " of the form suggested by Mills (1960). In this, the probability of a galaxy, chosen at random, having a ratio of radio to optical emission, defined by $m_{1\cdot 9}-m_p$, between $\underline{m}-\frac{1}{2}$ and $\underline{m}+\frac{1}{2}$ (where $\underline{m}=m_{1\cdot 9}-m_p$) is given by

$$\log P=1\cdot 0-0\cdot 42\underline{m}.$$

Applying this result to the galaxies listed in the catalogue we have used, we would expect 6 galaxies with $m_{1\cdot 9}-m_p\leqslant -2$ and 1 galaxy with $m_{1\cdot 9}-m_p\leqslant -4$. In fact there are 5 coincidences in the former category and 3 in the latter, a satisfactory but not particularly significant agreement.

Two galaxies, NGC 300 and NGC 55, which are within the catalogue area, had previously been listed as probably observed (Mills 1955) but are not in Table 4. The former is listed in the footnotes to Table 2 as a possible coincidence with the source 00—*317*, that is, it is within 1^{m} in Right Ascension and 20′ in declination. However, the identification is not certain because of a complex brightness distribution in the region ; this difficulty was noted previously. The radio source associated with the latter galaxy is too faint for detection by the methods used in preparing the catalogue and is not included ; originally it was necessary to average several records to observe it.

Finally, one should mention the two possible identifications found in the previously mentioned comparison of part of the catalogue area with the Palomar Sky Atlas. These are the sources 17—*23* and 21—*21* ; they are discussed elsewhere (Mills 1960).

IV. Statistics

The question of the distribution of the radio sources has been discussed at some length in papers I and II. The present results do not alter substantially any of the earlier conclusions, so that a very brief discussion should be adequate at this stage. More useful statistical investigations may be carried out when the angular size data are complete.

Previously we had divided the analysis into two parts, the first concerned with the two-dimensional distribution over the celestial sphere in an investigation of possible clustering effects, the second with the distribution in depth of the sources. These are not independent, but the division is convenient and will be adhered to here.

(*a*) *Clustering*

Earlier analysis had provided some slight, but not conclusive, indications of large-scale clustering of the radio sources. However, addition of the present data weakens the case and, on confining attention to regions of the order of 10° to 30° across, no convincing evidence exists that the distribution is non-random.

However, in the present catalogue a curious distribution arises, namely, the density of radio sources over the last few hours of the catalogue is very much less than over the first few. For example, the number of sources between 00^{h} and 02^{h} is 103 and between 22^{h} and 00^{h} only 56. The probability of this difference arising by chance in a random distribution is less than 0·001. Since the catalogue was prepared in a number of stages each commencing at 00^{h} and working through to 24^{h}, it seems possible that the result is an artefact. However, the catalogue of paper II was prepared in essentially the same manner and shows no such effect and, in addition, a careful re-examination of the original records supports the idea that the difference is real. The region of high source concentration includes the south galactic pole, but no reason is known why this should provide a surplus of radio sources.

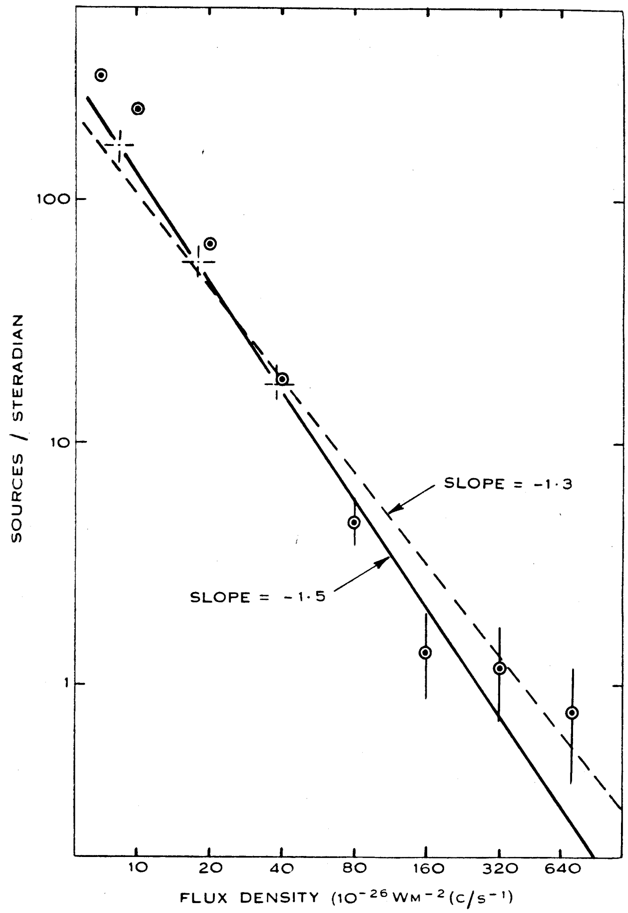

Fig. 1.—Counts of Class II radio sources.

In paper II the number of "extended" sources was compared with the number of blends of radio sources expected on the basis of a random distribution. It was concluded that there was a very significant difference, indicating that either the sources were extended regions of comparatively low brightness, or close blends of physically associated sources of small size. The present results support this conclusion although, surprisingly, the proportion of extended sources listed is much less than before. For example, between Right Ascensions of 09^{h} to 15^{h} and 21^{h} to 15^{h} (i.e. at high galactic latitudes) the numbers of extended sources with flux density greater than 40×10^{-26} W m^{-2} (c/s)$^{-1}$ is 9, and with flux density $>20\times10^{-26}$ W m^{-2} (c/s)$^{-1}$ is 19: the corresponding numbers expected on the basis of the previous catalogue are 16 and 29 respectively. Similarly, the number of sources with flux densities $>20\times10^{-26}$ W m^{-2} (c/s)$^{-1}$ listed as "perhaps extended" is now 7 compared with an expectation of 14; however, the availability of data from the angular size interferometer has helped to eliminate some doubtful examples. Since the chance blends above the same flux density limits may, from the data of paper I, be expected to be 2 and 11 respectively, the previous conclusion, that these are inadequate to explain the observations, is upheld.

(*b*) *Source Counts*

One of the most interesting questions arising from a study of the statistics of radio sources is their distribution in depth, which is investigated by means of counts of sources with fluxes above defined levels. Since there is a class of galactic source fairly closely confined to the plane it is usual to divide the analysis into two parts, dealing with the low latitude and high latitude sources separately. We will follow this procedure here, but, since the information about the galactic sources adds little or nothing to that presented in paper II and by Mills (1959), we will discuss only the high latitude or Class II sources (sources for which $|b|>12\frac{1}{2}°$).

In Figure 1 is shown the count resulting from a combination of the present catalogue and that in paper II. The actual numbers are listed in Table 5.

Table 5

THE NUMBERS OF CLASS II RADIO SOURCES ABOVE DEFINED FLUX DENSITIES

Flux density (10^{-26} Wm^{-2} (c/s)$^{-1}$) ..	7	10	20	40	80	160	320	640
Number of sources, N	1658	1220	332	94	24	7	6	4

The total area used in making these counts is nearly 5 steradians (2·72 steradians in paper II and 2·07 steradians in the present catalogue) and altogether there are 1658 sources with flux density $>7\times10^{-26}$ W m^{-2} (c/s)$^{-1}$ (the total number of Class II sources in the areas is 1700). Previously, the counts had been restricted at high intensities because of the fortuitous lack of such sources in the area of the catalogue; now, however, it may be extended much further, the range of flux density being nearly 100 : 1. The standard error in each point in Figure 1 is indicated by vertical wings; it is equal to $\sqrt{N}$, where N is the number of sources counted.

It has been shown in paper I that the counts need correction at low flux densities because of the effects of random noise and finite aerial resolution. Another effect was discovered when compiling the present catalogue, namely, a systematic tendency to over-estimate the flux density of a source when the signal-to-noise ratio is low. This appears quite distinct from the effects of noise previously considered; it was detected by comparison of flux densities measured on "scanning" and "non-scanning" records. The former have a noise level approximately double that of the latter and it was found that flux densities around 10×10^{-26} W m^{-2} (c/s)$^{-1}$ were, on the average, estimated higher on the scanning records by a factor of about 30 per cent. For sources of double the flux density the effect was still noticeable but much reduced. These differences appear to arise because a source position is always selected for which the noise fluctuations combine with the deflection due to the source to produce the greatest apparent flux density. This position is, in general, displaced from the true position, which, if known and adopted, would result in a lower estimate for the flux density. The effect of this type of error on the source counts is not large; this is fortunate, since it is difficult to assess an accurate correction without re-examination of all the original records. The most likely correction for the combined counts is a reduction of 30 per cent. for sources having fluxes near 10×10^{-26} W m^{-2} (c/s)$^{-1}$, and 10 per cent. for sources having fluxes near 20×10^{-26} W m^{-2} (c/s)$^{-1}$. In Figure 1 the crosses mark the corrected points, using both the data of paper I and the above corrections.

A straight line of slope $-1 \cdot 5$ is shown, drawn to fit the points as closely as possible; the fit is very good. Since this is the slope to be expected with a uniform distribution of source in a static Euclidean universe, the source counts indicate no divergence from uniformity and no obvious cosmological effects. It has been suggested by Mills (1960) that, among those sources which are associated with external galaxies, a source count having a mean slope of about $-1 \cdot 3$ might be expected, if account is taken of red-shift effects. A line of this slope is shown dotted; although the agreement is not particularly good, it is not inconsistent in view of the uncertain corrections to be applied at low flux densities and the statistical uncertainties at higher fluxes. It is known, however, that not all the high latitude radio sources in the catalogues could belong to this class (unless there is physical clustering of such sources) because of the inclusion of apparently "extended" sources in the catalogue, as discussed earlier.

Finally, one should mention a slight difference in the counts if the two catalogues are analysed separately, the numbers in the present catalogue being systematically less at a given flux density. Part of the discrepancy at low flux densities may be due to the availability of more non-scanning records in the area of the present catalogue and consequently less systematic error in the weaker fluxes, whence, for a given number of sources, the flux density will be lower. The remainder may be the result of a small calibration difference; this is likely, since the first catalogue includes zenith angles between 44° and 14°, the second includes zenith angles between 16° and 0°. A difference of 10 per cent. in the average calibrations in these areas would be adequate to explain the effect: this is about the accuracy of the calibrations, as discussed by Little (1958).

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