# GALAXY IDENTIFICATIONS FROM THE PARKES 2700 MHz SURVEY: THE SELECTED REGIONS AND THE ±4° DECLINATION ZONE

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*Abstract*

Identifications with galaxies are given for 127 of the radio sources in the first two parts of the Parkes 2700 MHz survey.

## I. Introduction

The coordinates of all sources in the catalogue resulting from the first two parts of the Parkes 2700 MHz survey (Wall, Shimmins, and Merkelijn, unpublished data) have been measured accurately in order to obtain complete identification statistics. In this paper the galaxy identifications are presented; the quasi-stellar object identifications will be presented in a companion paper (Bolton and Wall 1970).

## II. Position Measurements and Identification Procedure

The positions of all the survey sources have been measured with the Parkes 210 ft telescope and the 2700 MHz broad band correlation receiver (Batchelor, Brooks, and Cooper 1968) equipped with a dual beam feed system. The feed system

Table 1

centres of selected regions

| Plate Number | Position (1950·0) R.A. h | m | s | Dec. ° | ′ | Plate Number | Position (1950·0) R.A. h | m | s | Dec. ° | ′ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PS 1112 | 00 | 04 | 51 | +00 | 32 | PS 1777 | 12 | 04 | 50 | −00 | 31 |
| PS 891 | 00 | 52 | 55 | +00 | 31 | PS 1778 | 13 | 40 | 48 | −00 | 29 |
| PS 1114 | 02 | 32 | 31 | +00 | 25 | PS 896 | 22 | 03 | 26 | −18 | 50 |

produces on- and off-axis beams separated by 18′·5 arc and the difference between the signals at the two feeds is recorded. The main beam is approximately Gaussian with a width of 7′·9 arc to half-power points. The position of each source was measured by scanning the main beam through the source several times in both right ascension and declination. The resulting apparent positions were corrected for hour angle and diurnal pointing errors by observing sources from the Parkes grid of pointing calibrators. The position measurements are described in detail in the

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TABLE 2

DATA FOR GALAXY IDENTIFICATIONS IN SELECTED REGIONS, 2700 MHz SURVEY

| (1) | (2) | | | (3) | | | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PKS Source Number | Optical Position (1950·0) R.A. | | | Dec. | | | Optical–Radio Coordinate Differences ΔR.A. | ΔDec. | Type | $m_{pg}$ | $S_{2700}$ | References* | Galactic Coordinates $l^{II}$ | $b^{II}$ | Remarks |
| | h | m | s | ° | ′ | ″ | s | ′ | | | (f.u.) | | ° | ° | |
| PS 1112 | | | | | | | | | | | | | | | |
| 2356+01 | 23 | 56 | 38·9 | +01 | 50 | 06 | 2·4 f | 0·0 | E4 | 17·5 | 0·16 | | 98 | −58 | |
| 2357+00 | 23 | 57 | 25·0 | +00 | 25 | 24 | 0·8 p | 0·1 n | db | 15·6 | 0·27 | 9 | 97 | −60 | |
| 0003+006 | 00 | 03 | 28·0 | +00 | 37 | 18 | 2·3 f | 0·1 s | g | 18·3 | 0·25 | | 100 | −60 | |
| 0004−010 | 00 | 04 | 57·0 | −01 | 04 | 54 | 0·1 p | 0·3 s | E | 16·3 | 0·09 | | 99 | −62 | |
| 0007+016 | 00 | 07 | 24·0 | +01 | 41 | 30 | 0·3 p | 0·4 s | g | 20·5 | 0·16 | | 102 | −59 | Bright galaxy 1′·5 s.f. |
| 0012−008 | 00 | 12 | 29·5 | −00 | 51 | 30 | 1·6 p | 0·1 n | E | 18·0 | 0·12 | | 104 | −60 | |
| PS 891 | | | | | | | | | | | | | | | |
| 0038−019 | 00 | 38 | 48·2 | −01 | 59 | 18 | 1·0 f | 0·0 | S | 15·0 | 0·65 | | 117 | −64 | 4C−02·4 |
| 0040+017 | 00 | 40 | 15·0 | +01 | 46 | 00 | 0·1 f | 0·0 | N | 18·7 | 0·12 | | 119 | −61 | |
| 0041+015 | 00 | 41 | 59·6 | +01 | 35 | 36 | 2·0 p | 0·1 s | g | 19·5 | 0·06 | | 119 | −61 | |
| 0043+000 | 00 | 43 | 06·0 | +00 | 04 | 30 | 2·0 f | 0·1 n | E | 17·8 | 0·27 | | 120 | −62 | 4C−00·5 |
| 0043−003 | 00 | 43 | 53·0 | −00 | 21 | 42 | 1·0 f | 0·4 n | g | 18·5 | 0·10 | | 120 | −62 | |
| 0046+011 | 00 | 46 | 05·7 | +01 | 08 | 42 | | | Cl | — | 0·08 | | 121 | −61 | Position given is that of radio source |
| 0049+019 | 00 | 49 | 02·5 | +01 | 59 | 12 | 2·1 f | 0·0 | g | 20·2 | 0·11 | | 123 | −61 | |
| 0052+011 | 00 | 52 | 25·0 | +01 | 06 | 18 | 2·8 p | 0·1 s | S | 14·5 | 0·08 | | 125 | −61 | |
| 0053−016 | 00 | 53 | 29·3 | −01 | 35 | 54 | 1·1 p | 0·5 s | N | 16·4 | [0·71] | | 126 | −64 | PKS 0053−01, 4C−01·4; brighter galaxy 1′ n |
| 0053−015 | 00 | 53 | 52·4 | −01 | 32 | 42 | 0·4 f | 0·1 s | N | 16·7 | [0·78] | | 126 | −64 | |
| 0055−01 | 00 | 55 | 01·41 | −01 | 39 | 50·6 | | | E0 | 15·0 | [3·46] | 4, 27, 23 | 126 | −64 | 3C29, 4C−01·5; $z = 0·0450$ |
| 0100−011 | 01 | 00 | 08·5 | −01 | 06 | 30 | 1·5 p | 0·0 | g | 19·5 | 0·08 | | 130 | −62 | |
| 0101−006 | 01 | 01 | 29·6 | −00 | 40 | 24 | | | Cl | — | 0·08 | | 130 | −62 | Brightest galaxy of cluster ($m_{pg} = 16·3$) is 1′ s.f.; position given is that of radio source |
| PS 1114 | | | | | | | | | | | | | | | |
| 0222−00 | 02 | 22 | 32·8 | −00 | 49 | 36 | 2·2 p | 0·5 n | SO | 16·5 | 0·67 | 6 | 167 | −55 | 4C−00·12 |
| 0235+017 | 02 | 35 | 06·0 | +01 | 45 | 54 | 0·2 p | 1·0 n | E | 14·8 | 0·18 | | 168 | −51 | |
| 0239+002 | 02 | 39 | 12·6 | +00 | 13 | 54 | 0·2 p | 0·0 | S | 12 | 0·15 | | 171 | −52 | Prominent dust lane; NGC 1055 |
| 0240−00 | 02 | 40 | 07·00 | −00 | 13 | 31·1 | | | Sc | 9·7 | 3·12 | 18, 10, 11 | 171 | −51 | 3C71, 4C−00·13; NGC 1068; $z = 0·00344$ |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PS 1777 | | | | | | | | | | | | | | |
| 1152−011 | 11 | 52 | 27·2 | −01 | 09 | 12 | 0·4 f | 0·1 s | g | 18·3 | 0·08 | | 275 | 58 | Second galaxy 0′·3 n.p.; outside selected region |
| 1154−038 | 11 | 54 | 14·8 | −03 | 48 | 54 | 1·4 p | 0·4 n | D | 15·7 | 0·17 | | 278 | 56 | Outside selected region |
| 1157−008 | 11 | 57 | 49·0 | −00 | 49 | 12 | 1·4 p | 0·0 | S | 11·6 | 0·09 | | 276 | 61 | NGC 4030 |
| 1201−002 | 12 | 01 | 31·6 | −00 | 13 | 00 | 1·5 p | 0·1 n | g | 20·5 | 0·19 | | 278 | 61 | |
| 1201+027 | 12 | 01 | 32·1 | +02 | 41 | 24 | 1·0 f | 0·9 n | E | 16·9 | 0·16 | | 276 | 63 | Outside selected region |
| 1207−013 | 12 | 07 | 57·6 | −01 | 20 | 06 | 0·4 f | 0·1 s | db | 19·4 | 0·39 | | 282 | 60 | |
| 1208−035 | 12 | 08 | 45·6 | −03 | 33 | 24 | 0·4 p | 0·3 s | g | 19·6 | 0·08 | | 284 | 58 | |
| PS 1778 | | | | | | | | | | | | | | | |
| 1330+02 | 13 | 30 | 20·5 | +02 | 16 | 09 | 0·6 f | 0·2 n | N | 19·1 | [1·91] | 9, 27, 22 | 326 | 63 | 3C287·1, 4C+02·36; $z = 0{\cdot}2156$ |
| 1338+011 | 13 | 38 | 58·0 | +01 | 07 | 24 | 0·0 | 0·4 n | g | 20·2 | 0·16 | | 330 | 61 | |
| 1342−016 | 13 | 42 | 43·5 | −01 | 41 | 00 | 0·3 p | 0·3 s | D | 18·0 | 0·21 | | 329 | 58 | |
| 1349−01 | 13 | 49 | 49·0 | −01 | 41 | 42 | 0·4 f | 0·3 n | g | 19·6 | 0·31 | | 332 | 57 | 4C−01·30; in small cluster |
| 1351+003 | 13 | 51 | 18·3 | +00 | 21 | 06 | 0·7 f | 0·1 s | g | 20·2 | 0·07 | | 335 | 59 | |
| PS 896 | | | | | | | | | | | | | | | |
| 2149−158 | 21 | 49 | 11·0 | −15 | 51 | 36 | 3·7 f | 0·2 n | db | 17·1+17·3 | 0·32 | | 39 | −47 | Outside selected region |
| 2153−219 | 21 | 53 | 12·2 | −21 | 58 | 48 | 0·5 f | 0·1 n | N | 17·2 | 0·11 | | 31 | −50 | |
| 2155−202 | 21 | 55 | 02·0 | −20 | 12 | 54 | 2·7 f | 0·6 n | g | 19·6 | 0·22 | | 34 | −50 | |
| 2157−191 | 21 | 57 | 57·0 | −19 | 10 | 36 | 2·4 p | 0·5 n | g | 20·2 | 0·13 | | 35 | −50 | |
| 2201−217 | 22 | 01 | 16·0 | −21 | 41 | 42 | 0·4 f | 1·0 s | db | 16·5+17·3 | 0·15 | | 32 | −52 | Brightest of cluster |
| 2204−217 | 22 | 04 | 42·4 | −21 | 48 | 48 | 2·2 p | 0·5 s | E | 16·8 | 0·08 | | 32 | −52 | |
| 2211−17 | 22 | 11 | 41·5 | −17 | 16 | 48 | 0·5 p | 0·1 n | D | 19 | [4·52] | 30 | 40 | −52 | 3C444 |

* References are: 1, Bolton (1960); 2, Bolton (1968); 3, Bolton and Ekers (1966*a*); 4, Bolton and Ekers (1966*b*); 5, Bolton and Ekers (1966*c*); 6, Bolton and Ekers (1967); 7, Bolton, Shimmins, and Merkelijn (1968); 8, Burbidge (1967); 9, Clarke, Bolton, and Shimmins (1966); 10, Griffin (1963); 11, Humason, Mayall, and Sandage (1956); 12, Longair (1965); 13, Maltby, Matthews, and Moffet (1963); 14, Matthews (1965); 15, Matthews, Morgan, and Schmidt (1964); 16, Merkelijn (1969); 17, Mills (1960); 18, Mills, Slee, and Hill (1958); 19, Minkowski (1958); 20, Moffet (1965); 21, Moffet *et al.* (1967); 22, Sandage (1966); 23, Sandage (1967); 24, Sandage (1969); 25, Schmidt (1965); 26, Searle and Bolton (1968); 27, Véron (1966); 28, Whiteoak (personal communication); 29, Wills (1967); 30, Wyndham (1965); 31, Wyndham (1966).

TABLE 3

DATA FOR GALAXY IDENTIFICATIONS IN DECLINATION ZONE +4° TO −4°, 2700 MHz SURVEY

| (1) PKS Source Number | (2) Optical Position (1950·0) R.A. h | m | s | (3) Dec. ° | ′ | ″ | (4) Optical–Radio Coordinate Differences ΔR.A. s | (5) ΔDec. ′ | (6) Type | (7) $m_{pg}$ | (8) $S_{2700}$ (f.u.) | (9) References* | (10) Galactic Coordinates $l^{II}$ ° | (11) $b^{II}$ ° | (12) Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0029−01 | 00 | 28 | 59·3 | −01 | 17 | 24 | 0·4 p | 0·1 s | g | 19·4 | 0·52 | | 112 | −63 | 4C−01·2 |
| 0034−01 | 00 | 34 | 30·5 | −01 | 25 | 44·3 | 0·1 p | 0·1 s | E0 | 17·1 | [2·56] | 4, 27, 8 | 114 | −63 | 3C15, 4C−01·3; $z = 0·0733$ |
| 0035−02 | 00 | 35 | 46·79 | −02 | 24 | 10·2 | | | E | 19·6 | 4·04 | 20, 21, 25 | 115 | −64 | 3C17, 4C−02·3; $z = 0·2201$ |
| 0036+03 | 00 | 36 | 43·8 | +03 | 03 | 24 | 0·4 p | 0·1 s | E2 | 13·5 | [1·11] | 9, 29 | 117 | −59 | 4C+03·1; NGC 193; $z = 0·0145$ |
| 0038−019 | 00 | 38 | 48·2 | −01 | 59 | 18 | 1·0 f | 0·0 | S | 15·0 | 0·65 | | 117 | −64 | 4C−02·4 |
| 0051−03 | 00 | 51 | 35·6 | −03 | 50 | 11·3 | 1·2 p | 0·1 n | E | 19·1 | 1·11 | 4, 2, 25 | 124 | −66 | 3C26, 4C−03·3; $z = 0·2106$ |
| 0053−016 | 00 | 53 | 29·3 | −01 | 35 | 54 | 1·1 p | 0·5 s | N | 16·4 | [0·71] | | 126 | −64 | PKS 0053−01, 4C−01·4; |
| 0053−015 | 00 | 53 | 52·4 | −01 | 32 | 42 | 0·4 f | 0·1 s | N | 16·7 | [0·78] | | 126 | −64 | brighter galaxy 1′ n |
| 0055−01 | 00 | 55 | 01·4 | −01 | 39 | 50·6 | 0·5 f | 0·2 s | E0 | 15·0 | [3·46] | 4, 27, 23 | 126 | −64 | 3C29, 4C−01·5; $z = 0·0450$ |
| 0111+021 | 01 | 11 | 08·8 | +02 | 06 | 24 | 0·4 f | 0·1 n | E | 16·3 | 0·61 | | 134 | −60 | Radio spectrum flat or inverted |
| 0115−01 | 01 | 15 | 41·5 | −01 | 36 | 00 | 1·9 f | 0·3 n | N | 18·3 | 0·52 | 6 | 138 | −63 | 4C−01·7; jet in p.a. ∼ 100° |
| 0123−01 | 01 | 23 | 26·0 | −01 | 35 | 59·5 | — | — | E+E | 12·8 | [2·75] | 19, 10, 13 | 142 | −62 | 3C40, 4C−01·8; NGC 545/7; |
| | | | 27·5 | | 36 | 17·2 | | | | | | | | | $z = 0·0180$ |
| 0128+003 | 01 | 28 | 59·1 | +00 | 17 | 54 | 0·9 p | 0·2 n | E | 16·1 | 0·33 | | 144 | −61 | 4C+00·5 |
| 0217+01 | 02 | 17 | 24·5 | +01 | 41 | 54 | 0·9 p | 0·1 n | E7 | 15·2 | 0·36 | 9 | 163 | −54 | |
| 0218−02 | 02 | 18 | 21·90 | −02 | 10 | 33·0 | | | E | 19·1 | 1·68 | 4, 27 | 167 | −57 | 3C63, 4C−02·10 |
| 0222−00 | 02 | 22 | 32·8 | −00 | 49 | 36 | 2·2 p | 0·5 n | SO | 16·5 | 0·67 | 6 | 167 | −55 | 4C−00·12 |
| 0240−00 | 02 | 40 | 07·00 | −00 | 13 | 31·1 | | | Sc | 9·7 | 3·12 | 18, 10, 11 | 171 | −51 | 3C71 4C−00·13; NGC 1068; $z = 0·00344$ |
| 0252+02 | 02 | 52 | 33·7 | +02 | 41 | 36 | 0·1 f | 0·0 | N | 19·9 | 0·41 | 16 | 172 | −48 | 3C74, 4C+02·8 |
| 0305+03 | 03 | 05 | 49·03 | +03 | 55 | 12·7 | | | D | 14·4 | [5·33] | 1, 10, 15 | 175 | −45 | 3C78, 4C+03·5; NGC 1218; $z = 0·0289$ |
| 0325+02 | 03 | 25 | 18·25 | +02 | 23 | 20·4 | 1·0 f | 0·0 | D | 14·9 | [3·18] | 14, 27, 15 | 181 | −42 | 3C88, 4C+02·10; $z = 0·0302$ |
| 0331−01 | 03 | 31 | 43·37 | −01 | 21 | 26·3 | 0·6 p | 0·0 | D | 18·3 | [1·39] | 4, 27 | 185 | −42 | 3C89, 4C−01·12 |
| 0353+027 | 03 | 53 | 23·0 | +02 | 47 | 42 | 0·4 f | 0·1 s | N | 19·1 | 0·47 | | 186 | −36 | 4C+02·11; galaxy shows u.v. excess |
| 0448−025 | 04 | 48 | 49·9 | −02 | 33 | 48 | 0·2 f | 0·2 s | g | 20·2 | 0·25 | | 201 | −28 | 4C−02·18 |
| 0458+01 | 04 | 58 | 03·5 | +01 | 26 | 00 | 0·4 f | 0·2 s | E | 18·5 | 0·52 | | 198 | −24 | 4C+01·12 |
| 0511+00 | 05 | 11 | 33·78 | +00 | 53 | 07·9 | 0·5 p | 0·1 n | E | 17·5 | [1·70] | 9, 27, 23 | 200 | −21 | 3C135, 4C+00·19; $z = 0·1270$ |
| 0723−036 | 07 | 23 | 35·6 | −03 | 38 | 30 | 0·4 f | 0·1 s | db | 17·5+18·0 | 0·32 | | 220 | 6 | |
| | | | | | 38 | 48 | | | | | | | | | |
| 0724−01 | 07 | 24 | 33·27 | −01 | 58 | 24·4 | 0·6 p | 0·0 | g | 20·2 | [1·56] | 4, 27 | 218 | 6 | 3C180, 4C−02·31 |
| 0726−00 | 07 | 26 | 15·3 | −00 | 02 | 30 | 1·1 p | 0·0 | g | 20·2 | 0·40 | 6 | 217 | 8 | 4C−00·25 |
| 0742+02 | 07 | 42 | 27·94 | +02 | 07 | 44·6 | 0·4 f | 0·2 s | g | 19·5? | [0·82] | 31, 27 | 217 | 13 | 3C187, 4C+02·21 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0752−02·7 | 07 | 52 | 16·4 | −02 | 39 | 36 | 0·4 f | 0·1 n | N | 19·4 | 0·46 | | 223 | 13 | 4C−02·33 |
| 0752−02·3 | 07 | 52 | 25·3 | −02 | 14 | 12 | 1·3 f | 0·7 s | db | 15·8+16·2 | 0·42 | | 222 | 13 | |
| 0803−00 | 08 | 03 | 04·6 | −00 | 49 | 42 | 0·6 p | 0·0 | E4 | 15·4 | 0·71 | 4 | 222 | 16 | 4C−00·32 |
| 0812−02 | 08 | 12 | 57·32 | −02 | 59 | 13·9 | | | D | 18·9 | 0·95 | 4, 27 | 225 | 17 | 3C196·1, 4C−02·35 |
| 0833−01 | 08 | 33 | 02·0 | −01 | 40 | 42 | 1·0 f | 0·0 | E | 13·9 | [0·56] | 6 | 227 | 22 | Some jet structure |
| 0859+032 | 08 | 59 | 15·2 | +03 | 16 | 12 | 0·2 p | 0·0 | g | 20·2 | 0·34 | | 227 | 30 | |
| 0956+015 | 09 | 56 | 46·3 | +01 | 32 | 24 | 0·0 | 0·0 | db? | 15·8 | 0·30 | | 238 | 41 | |
| 1005+007 | 10 | 05 | 37·3 | +00 | 44 | 48 | 0·0 | 0·2 s | N | 16·9 | 0·34 | | 240 | 43 | |
| 1008−01 | 10 | 08 | 18·8 | −01 | 46 | 12 | 1·0 f | 0·1 s | S? | 19·4 | [0·80] | | 243 | 42 | 4C−01·21 |
| 1027+00 | 10 | 27 | 36·3 | +00 | 53 | 06 | 0·3 f | 0·3 s | g | 19·4 | 0·61 | | 245 | 47 | 4C+00·35 |
| 1033+003 | 10 | 33 | 31·9 | +00 | 21 | 48 | 0·6 f | 0·0 | E | 16·5 | 0·34 | | 247 | 48 | 4C+00·37 |
| 1039+02 | 10 | 39 | 05·3 | +02 | 58 | 06 | 0·6 p | 0·2 n | g | 19·4 | 1·66 | | 246 | 51 | 4C+03·18 |
| 1051+035 | 10 | 51 | 51·6 | +03 | 30 | 42 | 0·2 f | 0·0 | db | 20·2 | 0·29 | | 248 | 53 | 4C+03·19 |
| 1103+002 | 11 | 03 | 15·0 | +00 | 14 | 00 | 1·8 f | 1·0 n | S | 9·8 | 0·29 | 11 | 256 | 53 | NGC 3521; $z = 0{\cdot}00205$ |
| 1106+023 | 11 | 06 | 11·1 | +02 | 19 | 00 | 0·2 p | 0·1 s | N | 18·9 | 0·64 | | 254 | 55 | |
| 1111−037 | 11 | 11 | 58·9 | −03 | 44 | 54 | 0·4 p | 0·3 n | g | 18·3 | 0·35 | | 262 | 51 | 4C−03·41; BSO near position is also marked on finding chart |
| 1118+000 | 11 | 18 | 46·1 | +00 | 03 | 06 | 1·1 p | 0·1 s | db | 17·0+18·5 | 0·44 | | 261 | 55 | |
| 1127+005 | 11 | 27 | 02·8 | +00 | 31 | 48 | | | Cl | — | 0·58 | | 263 | 57 | 4C+00·40; cluster of faint galaxies; radio source position |
| 1127+012 | 11 | 27 | 47·3 | +01 | 15 | 00 | 0·3 f | 0·1 s | N | 17·8 | 0·41 | | 263 | 57 | 4C+01·30 |
| 1130−037 | 11 | 30 | 32·4 | −03 | 44 | 12 | 1·4 p | 0·1 s | E | 15·3 | 0·54 | | 269 | 54 | 4C−03·43 |
| 1141+011 | 11 | 41 | 35·0 | +01 | 11 | 18 | 0·5 f | 0·1 s | g | 19·4 | 0·33 | | 268 | 59 | |
| 1147+015 | 11 | 47 | 51·5 | +01 | 32 | 42 | 0·0 | 0·0 | g | 19·9 | 0·31 | | 271 | 60 | 4C+01·33 |
| 1207−013 | 12 | 07 | 57·6 | −01 | 20 | 06 | 0·0 | 0·1 s | db | 19·4 | 0·39 | | 282 | 60 | |
| 1215+03 | 12 | 15 | 07·0 | +03 | 56 | 00 | — | — | D+E | 17·3 | [1·21] | 10, 8 | 283 | 65 | 4C+04·41; $z = 0{\cdot}0756, 0{\cdot}0771$; complex source |
| | | 14 | 58·3 | | 53 | 48 | | | | 17·3 | | | | | |
| 1249+035 | 12 | 49 | 50·0 | +03 | 32 | 12 | 0·0 | 0·0 | E2 | 16·8 | 0·60 | | 304 | 66 | |
| 1307−00·1 | 13 | 07 | 16·5 | +00 | 03 | 00 | 0·0 | 0·0 | D | 19·4 | 0·82 | | 313 | 62 | 4C+00·46 |
| 1320+03 | 13 | 20 | 46·0 | +03 | 23 | 48 | 1·4 f | 0·1 n | D | 19·9 | 0·75 | 9 | 322 | 65 | 4C+03·27 |
| 1324−025 | 13 | 24 | 33·0 | −02 | 33 | 48 | 1·0 p | 0·0 | g | 19·4 | 0·31 | | 320 | 59 | |
| 1325−01 | 13 | 25 | 04·0 | −01 | 47 | 36 | 0·3 f | 0·2 n | D | 18·7 | 0·71 | 6 | 321 | 60 | 4C−01·29 |
| **1330+02** | **13** | **30** | **20·5** | **+02** | **16** | **09·0** | **0·6 f** | **0·2 n** | **N** | **19·1** | **[1·91]** | **9, 27, 22** | **326** | **63** | **3C287·1, 4C+02·36; $z = 0{\cdot}2156$** |
| 1349−01 | 13 | 49 | 49·0 | −01 | 41 | 42 | 0·4 f | 0·3 n | g | 19·6 | 0·31 | | 332 | 57 | 4C−01·30 |
| 1359+025 | 13 | 59 | 59·2 | +02 | 30 | 12 | 0·2 f | 0·3 n | N | 19·4 | 0·57 | | 340 | 60 | 4C+02·39 |
| 1404−01 | 14 | 04 | 15·2 | −01 | 39 | 54 | 0·5 p | 0·1 s | g | 20·2 | 0·58 | 7 | 338 | 56 | 4C−01·31; blue galaxy |
| 1418−025 | 14 | 18 | 38·3 | −02 | 33 | 48 | 0·7 f | 0·2 n | g | 18·1 | 0·25 | | 342 | 53 | 4C−02·60 |
| 1425−01 | 14 | 25 | 54·7 | −01 | 10 | 36 | 1·7 f | 0·1 s | N | 17·3 | 1·64 | 8 | 346 | 53 | 3C300·1, 4C−01·34; jet in p.a. ∼ 260° |
| 1431+018 | 14 | 31 | 36·4 | +01 | 50 | 06 | 1·8 p | 0·1 s | E | 17·4 | 0·32 | | 351 | 55 | |
| 1435+038 | 14 | 35 | 51·5 | +03 | 53 | 06 | 0·9 f | 0·0 | g | 17·8 | 0·35 | | 355 | 55 | |

* For references see footnote at end of Table 2.

TABLE 3 (*Continued*)

| (1) PKS Source Number | (2) Optical Position (1950·0) R.A. h | m | s | (3) Dec. ° | ′ | ″ | (4) Optical–Radio Coordinate Differences ΔR.A. s | (5) ΔDec. ′ | (6) Type | (7) $m_{pg}$ | (8) $S_{2700}$ (f.u.) | (9) References* | (10) Galactic Coordinates $l^{II}$ ° | (11) $b^{II}$ ° | (12) Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1442−029 | 14 | 42 | 20·2 | −02 | 59 | 12 | 0·4 p | 0·1 n | E | 17·6 | 0·27 | | 349 | 49 | |
| 1446+00 | 14 | 46 | 07·4 | +00 | 30 | 48 | 1·4 p | 0·3 s | E | 19·4 | 1·04 | 9 | 354 | 51 | 4C+00·52; fainter galaxy closer to radio position |
| 1514+00 | 15 | 14 | 05·3 | +00 | 26 | 00 | 2·3 f | 0·3 s | E3 | 15·9 | [1·83] | 7, 26 | 1 | 46 | 4C+00·56; $z$ = 0·053; complex source; QSO 0′·7 n.f. |
| 1542+02 | 15 | 43 | 03·7 | +01 | 59 | 12 | 1·4 p | 0·0 | E | 18·5 | 0·51 | 3 | 9 | 41 | 4C+01·45 |
| 1559+02 | 15 | 59 | 55·67 | +02 | 06 | 12·3 | | | D | 16·5 | [5·04] | 1 10, 15 | 13 | 38 | 3C327, 4C+02·41; $z$ = 0·1041 |
| 1601−00 | 16 | 01 | 19·1 | −00 | 21 | 42 | 0·7 p | 0·3 s | N | 17·5 | 0·45 | | 11 | 37 | 4C−00·63 |
| 1601−017 | 16 | 01 | 44·6 | −01 | 47 | 06 | 1·1 p | 0·1 s | E | 19·1 | 0·31 | | 9 | 35 | |
| 1603+00 | 16 | 03 | 39·02 | +00 | 08 | 29·3 | | | E4 | 16·3 | 1·50 | 30, 2 | 1 | 26 | 4C+00·58 |
| 1616−029 | 16 | 16 | 31·4 | −02 | 57 | 12 | 1·3 p | 0·2 s | E | 16·6 | 0·40 | | 10 | 32 | |
| 1636−03 | 16 | 36 | 18·5 | −03 | 07 | 36 | 1·5 p | 0·1 s | g | 19·9 | 0·45 | 16 | 13 | 27 | 4C−03·61 |
| 1643+022 | 16 | 43 | 11·4 | +02 | 17 | 12 | 1·4 p | 0·1 n | E | 18·0 | 1·16 | | 20 | 29 | 4C+02·42; $18^m·7$ galaxy 30″ p |
| 1650+024 | 16 | 50 | 27·7 | +02 | 29 | 06 | 1·8 f | 0·5 n | g | — | 0·30 | 28 | 21 | 27 | 4C+02·44, NGC 6240; $z$ = 0·0261; peculiar galaxy |
| 1708+00 | 17 | 08 | 01·5 | +00 | 40 | 12 | 1·4 p | 0·1 n | db | 21·0 | 0·83 | 3 | 21 | 23 | 4C+00·65 |
| 1717−00 | 17 | 17 | 53·29 | −00 | 55 | 49·5 | 2·4 f | 0·0 | D | 16·6 | [33·8] | 17, 10, 15 | 23 | 21 | 3C353, 4C−00·67; $z$ = 0·0307 |
| 1949+02 | 19 | 49 | 44·57 | +02 | 22 | 37·1 | | | SO | 16·4 | [3·68] | 31, 27, 24 | 42 | −12 | 3C403, 4C+02·50; $z$ = 0·0590 |
| 1949−01 | 19 | 49 | 55·20 | −01 | 25 | 07·2 | | | E | 17·5? | [0·79] | 4, 27 | 38 | −14 | 3C403·1, 4C−01·51 |
| 2123+00 | 21 | 23 | 13·1 | +00 | 43 | 06 | 1·8 p | 0·2 n | db | 17·5+18·3 | 0·38 | 9 | 54 | −33 | 4C+00·79 |
| 2150−031 | 21 | 50 | 01·4 | −03 | 08 | 48 | 0·1 f | 0·2 n | g | 19·6 | 0·30 | | 55 | −41 | 4C−03·75 |
| 2217−011 | 22 | 17 | 11·4 | −01 | 05 | 48 | 0·9 p | 0·3 s | g | 20·2 | 0·28 | | 62 | −45 | |
| 2221−02 | 22 | 21 | 14·76 | −02 | 21 | 26·1 | 0·7 f | 0·4 s | N | 17·5 | [3·46] | 14, 15 | 62 | −47 | 3C445, 4C−02·83; $z$ = 0·0568 |
| 2243−03 | 22 | 43 | 37·1 | −03 | 16 | 36 | 1·1 p | 0·2 n | g | 21·0 | 0·65 | 6 | 66 | −52 | 4C−03·81; blue galaxy |
| 2313+01 | 23 | 13 | 43·2 | +01 | 12 | 36 | 0·7 f | 0·0 | g | 19·4 | 0·58 | 16 | 80 | −53 | 4C+01·74 |
| 2313+03 | 23 | 14 | 02·30 | +03 | 48 | 56·0 | | | N | 18·7 | 2·38 | 12, 27, 25 | 83 | −51 | 3C459, 4C+03·57; $z$ = 0·2205 |
| 2324−02 | 23 | 24 | 19·40 | −02 | 18 | 43·7 | | | E | 18·0 | [1·56] | 4, 2 | 80 | −57 | |
| 2338−002 | 23 | 38 | 26·2 | −00 | 11 | 48 | 0·2 p | 0·5 s | db | 17·2 | 0·38 | | 87 | −58 | 4C−00·83 |
| 2338+000 | 23 | 38 | 32·7 | +00 | 01 | 54 | 2·0 f | 0·2 n | E | 19·1 | 0·36 | | 88 | −58 | |
| 2338+03 | 23 | 38 | 57·0 | +03 | 00 | 48 | 0·7 p | 0·2 n | g | 20·2 | 0·38 | | 91 | −55 | 4C+03·60 |
| 2349−01 | 23 | 49 | 22·30 | −01 | 25 | 54·2 | | | N | 17·1 | 1·01 | 5, 2. 26 | 91 | −60 | 4C−01·61; $z$ = 0·174 |

* For references see footnote at end of Table 2.

2700 MHz catalogue; similar observations have been described by Merkelijn (1968, 1969). The standard error in the position measurements averages 12″ arc in both coordinates for sources stronger than $S_{2700} = 1{\cdot}5$ f.u.* and 16″ arc for sources of $S_{2700} = 0{\cdot}15$ f.u., and increases rapidly for sources of still lower flux densities.

The prints of the Palomar Sky Survey were searched at the measured source positions with the aid of computer-drawn transparent overlays. A 2′ arc square field, centred on the source position, is plotted on these overlays, together with the positions of 10 nearby stars from the Smithsonian catalogue. The technique has been described in detail in previous Parkes identification papers.

## III. Identifications

The first part of the 2700 MHz catalogue consists of all sources with $S_{2700} \geqslant 0{\cdot}10$ f.u. in six selected regions of 41 square degrees each. Many sources for which $S_{2700} < 0{\cdot}10$ f.u. are also tabulated. The regions correspond to areas covered by six two-colour (blue–ultraviolet) plates taken by J. G. Bolton with the 48 in. Schmidt telescope of the Palomar Observatory. The centres of the plate areas are listed in Table 1. In Table 2, 42 sources in these regions for which galaxies are considered as identifications are listed. The upper limit to the differences permitted between radio and optical coordinates was 1′ arc; the criterion was varied according to optical apparent magnitude and estimated error in the radio position. Of the 42 sources, 6 had been previously identified (see references for Table 2).

The second part of the 2700 MHz catalogue consists of sources found in a survey of the declination zone $+4°$ to $-4°$. Right ascensions $06^h\,00^m$ to $07^h\,21^m$ and $18^h\,00^m$ to $19^h\,40^m$, regions which are heavily obscured on the Sky Survey prints, were excluded from the survey. The catalogue is believed to be complete to $0{\cdot}35$ f.u. at 2700 MHz and includes many weaker sources. In Table 3, 94 sources for which galaxies are considered as identifications are listed. The upper limit to coordinate discrepancies permitted was $0'{\cdot}5$ arc, the criterion varying as above. Of the 94 sources, 45 had been identified in previous programs (see references for Table 3). For completeness nine sources from Table 2 have been included in Table 3. (Five of the six selected regions lie in the $\pm 4°$ declination zone.)

The data in Tables 2 and 3 are presented as follows. Column 1 contains the Parkes source number. Sources found in the 2700 MHz survey are distinguished by an additional digit which represents tenths of degrees in declination. Columns 2 and 3 contain the $1950{\cdot}0$ coordinates of the optical centroid of the galaxy as estimated from the Palomar Sky Atlas prints. Standard errors in these estimates are 6″ arc. For the well-established identifications, accurate optical positions as obtained by other authors are given. Columns 4 and 5 list the optical–radio coordinate differences, the entries denoting the measured position of the radio source relative to the position of the galaxy centroid. The differences are not given for those sources which have been used in pointing calibration. The morphological type as estimated from the Sky Survey prints is given in column 6, with the abbreviations: S, spiral galaxy; E, elliptical galaxy; D, galaxy with diffuse outer envelope; N, compact galaxy; db, double galaxy; Cl, cluster; and g, galaxy too faint for classification. Column 7

* 1 flux unit (f.u.) $= 10^{-26}$ W m$^{-2}$ Hz$^{-1}$.

gives the photographic magnitude $m_{pg}$ to an accuracy of $0^m \cdot 5$. The 2700 MHz flux densities $S$ are entered in column 8; square brackets indicate that the flux density has been corrected for partial resolution. Errors in flux density are about $\{(0 \cdot 012)^2 + (0 \cdot 03 S_{2700})^2\}^{\frac{1}{2}}$ f.u. The entries in column 9 are references, in order, to the previous identification of the source, the measurement of accurate optical position, and the redshift $z$. Galactic coordinates are given in columns 10 and 11. The remarks in column 12 include Cambridge catalogue numbers and redshifts.

## IV. Finding Charts

Finding charts for the 36 new identifications of Table 2 are given in Figures 1–5, while those for the 44 new identifications of Table 3 which do not appear in Table 2 are given in Figures 6–11. All charts have been prepared from the [E] (red) Sky Survey print, and contrast has been increased over that of the originals. The scale is approximately 5 mm = 1′ arc, and north-east is to the upper left-hand corner.

## V. Conclusions

The two-colour plates which define the selected areas were taken in regions of negligible obscuration. Consequently, Table 2 is believed to contain all galaxies in the selected regions with $S_{2700} \geqslant 0 \cdot 10$ f.u. and with $m_{pg} \leqslant 20^m \cdot 5$, the plate limit. In the $\pm 4°$ declination zone, heavy obscuration is evident on the Palomar Sky Survey for right ascensions $05^h$ to $07^h 20^m$ and $18^h$ to $19^h 40^m$, and there may be significant obscuration up to $20^h 30^m$. Outside these areas, Table 3 is thought to be complete to the limiting $m_{pg}$ of $20^m \cdot 5$ and to $S_{2700} = 0 \cdot 35$ f.u.

The present observations confirm most galaxy identifications previously suggested for the $\pm 4°$ declination zone. The identifications of galaxies with the following sources appear to be in error on the basis of the present observations:

| | |
|---|---|
| PKS 0118−00, 0131−00, 0300−00, 0747−00, 1159−02 | Bolton and Ekers (1967) |
| PKS 1307−00·7 | Bolton and Ekers (1967); Merkelijn (1969) |
| PKS 0029+01, 0031+01, 0505+03, 0932+02, 1354+01 | Clarke, Bolton, and Shimmins (1966) |
| PKS 0358+00 | Wyndham (1966) |

In addition, further position measurements on PKS 0439+01 and 1523+03 are necessary. The present observations indicate differences of about 30″ arc between the radio positions and the positions of the suggested galaxy identifications (Bolton and Ekers 1966*a*). Finally, we note that Gent, Adgie, and Crowther (1969) show the identification suggested for PKS 0949+00 (Bolton and Ekers 1966*a*) to be incorrect.

The sources PKS 0239+002, 1103+002, and 1157−008 are identified with the bright spiral galaxies NGC 1055, 3521, and 4030. These galaxies are "normal" in the radio sense; it is evident that surveys to fainter flux density limits such as the present one will detect increasing numbers of such objects. Finding charts for these three objects have been included to illustrate the morphological characteristics.

Figs 1–11.—Finding charts for the new identifications. The scale is 5 mm ≈ 1′ arc. North-east is at the top left-hand corner of each chart.

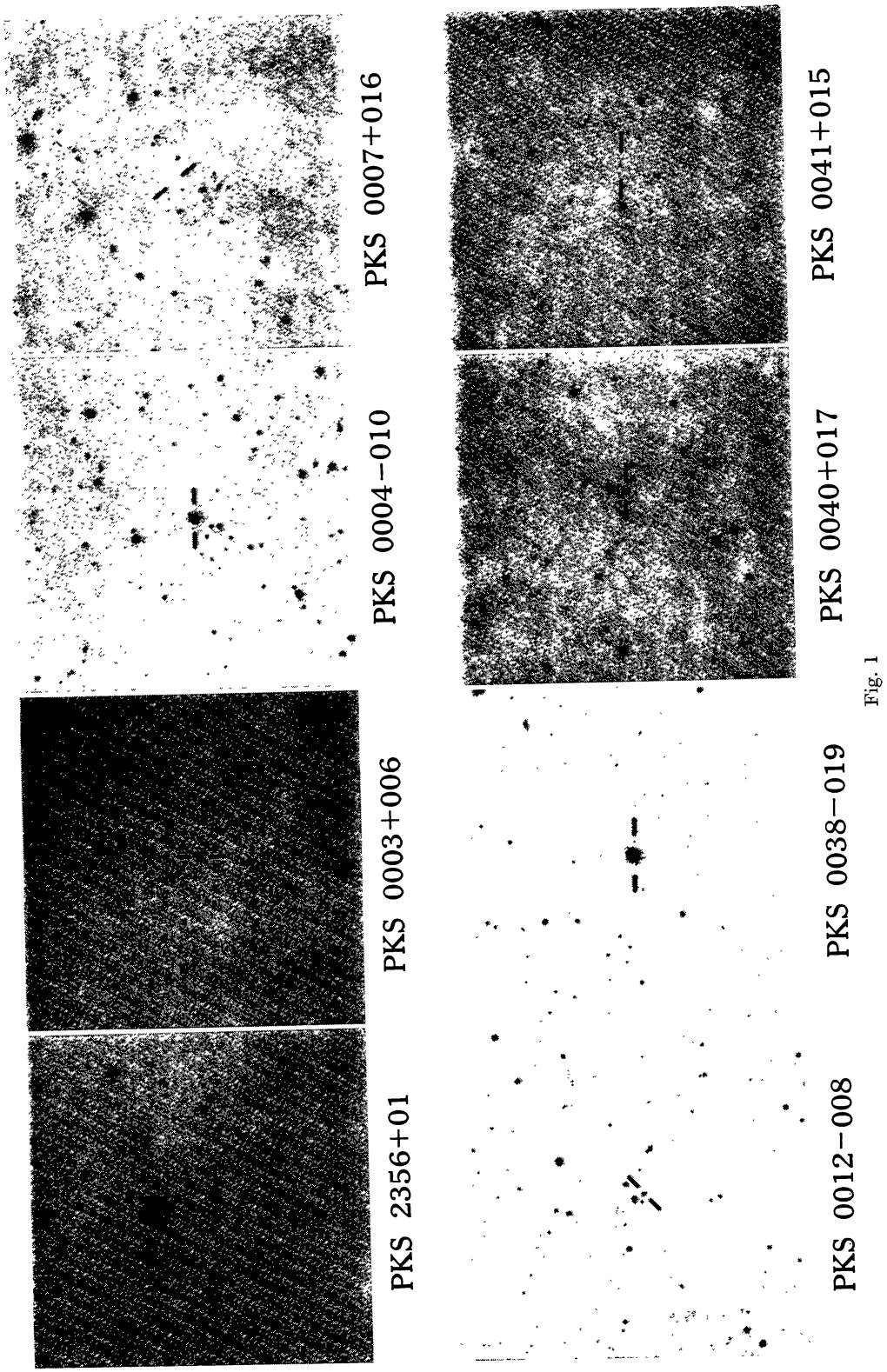


Fig. 1

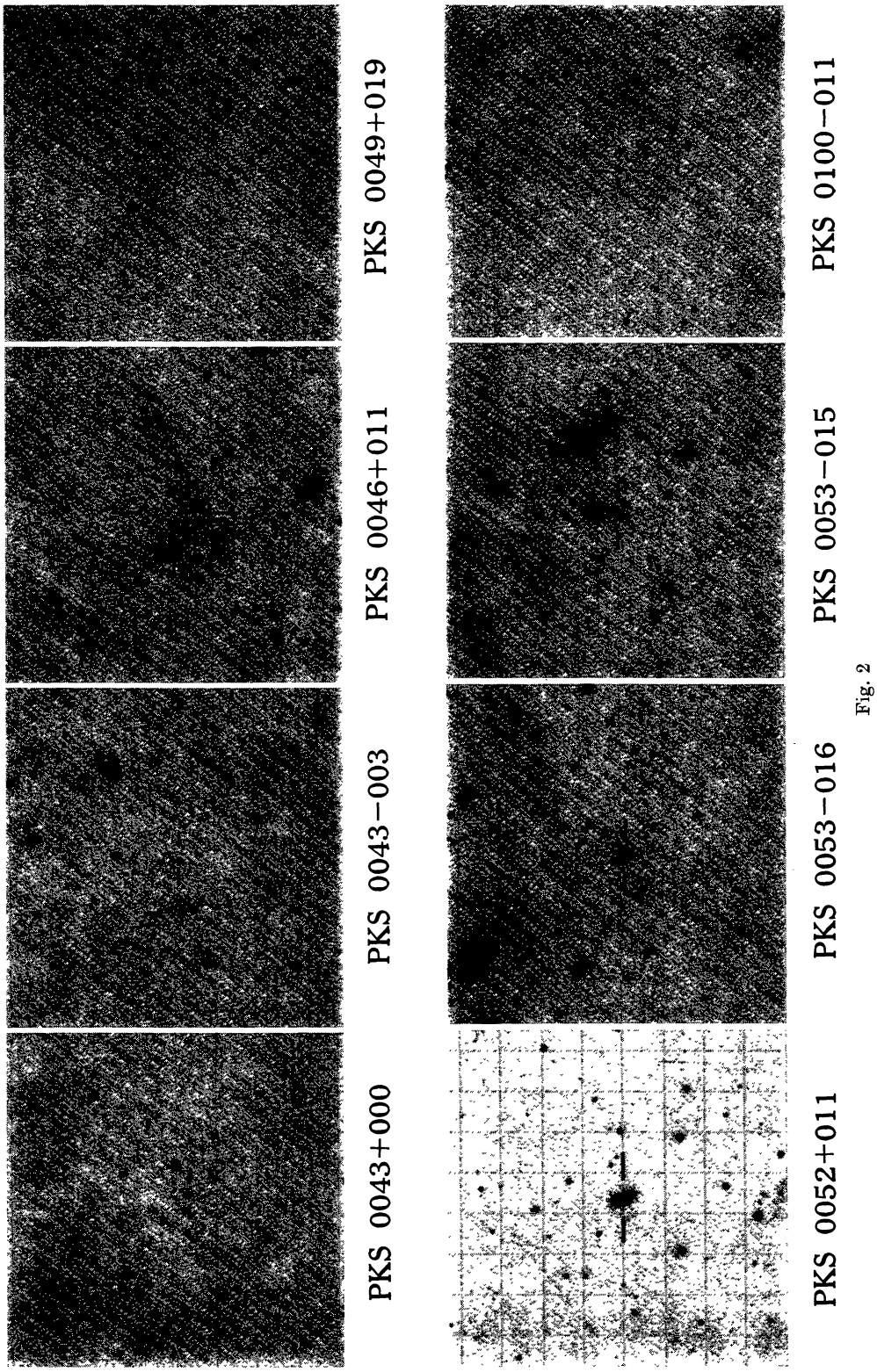


Fig. 2

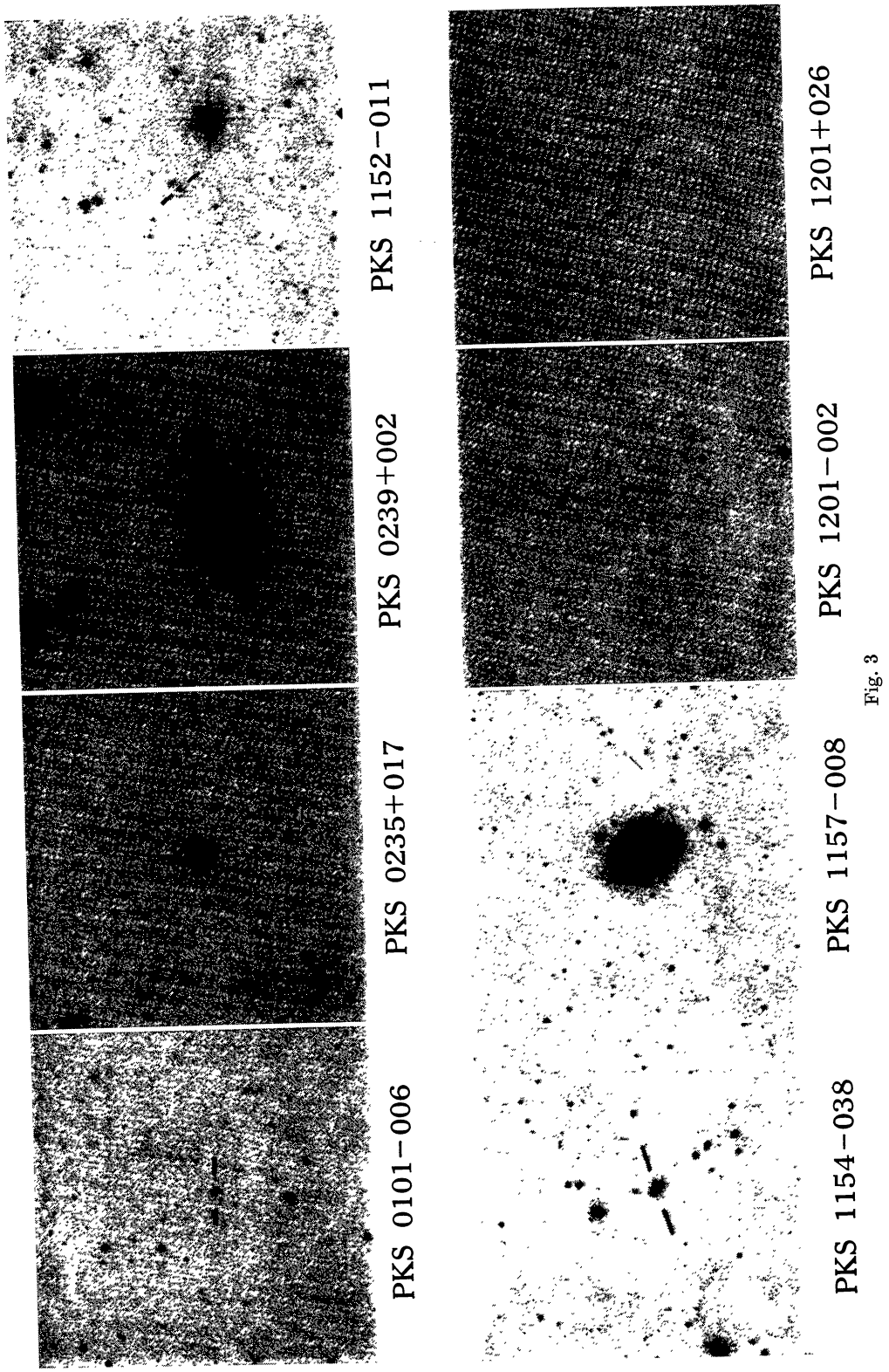


Fig. 3

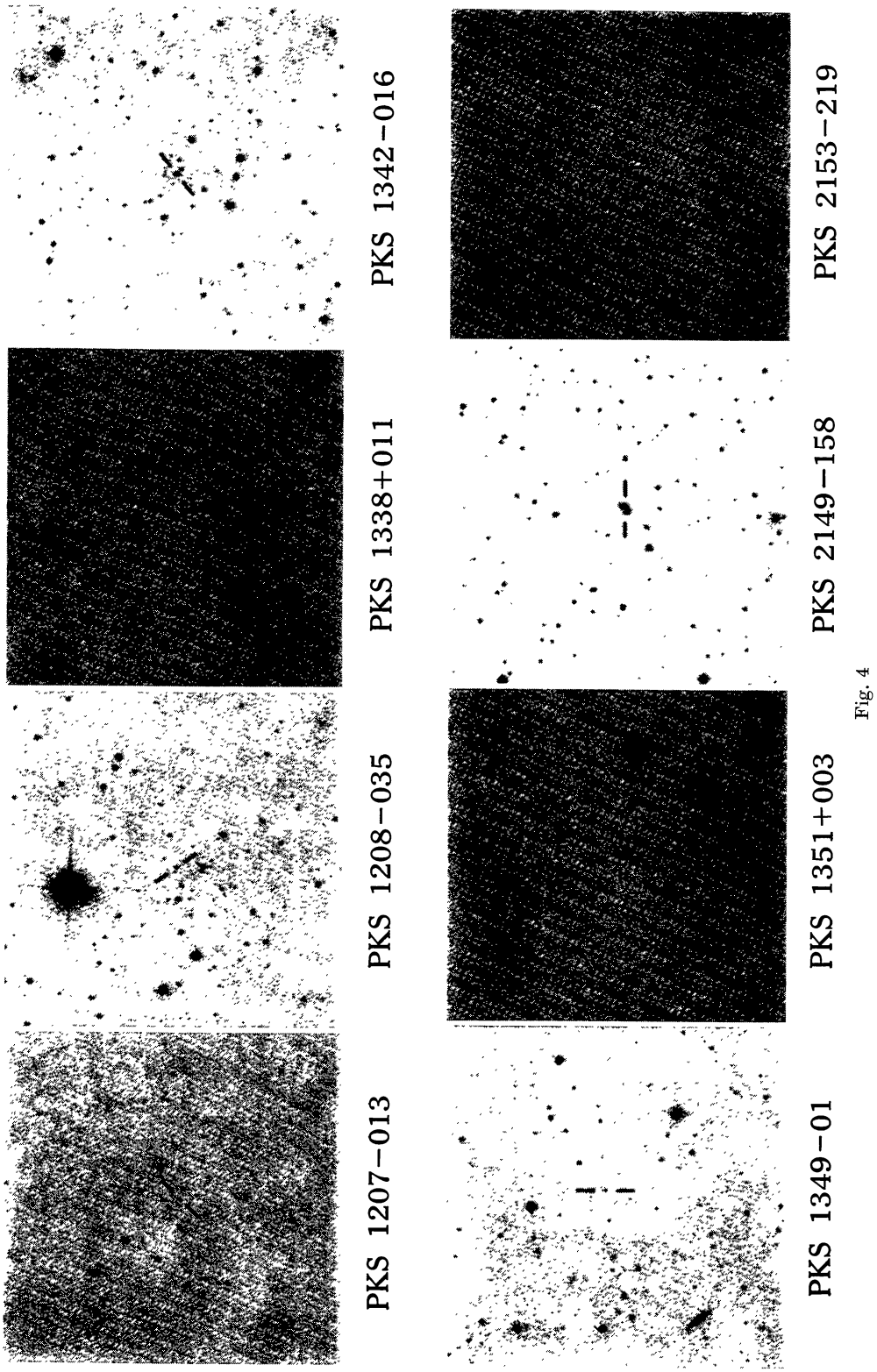


Fig. 4

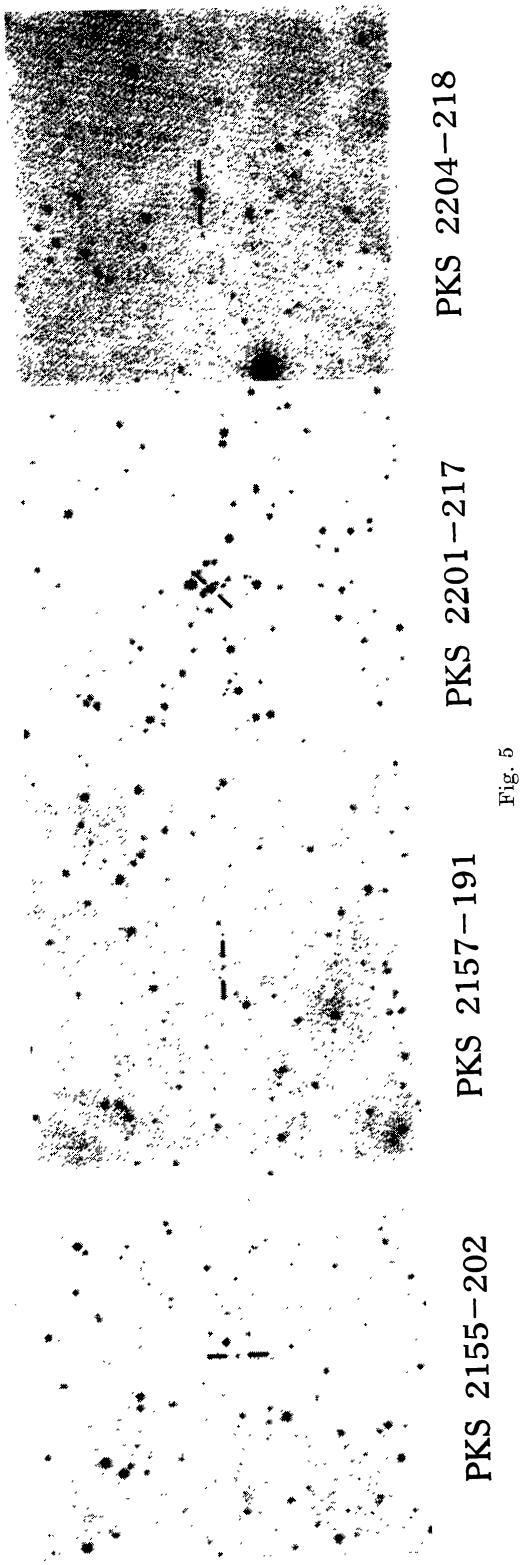


Fig. 5

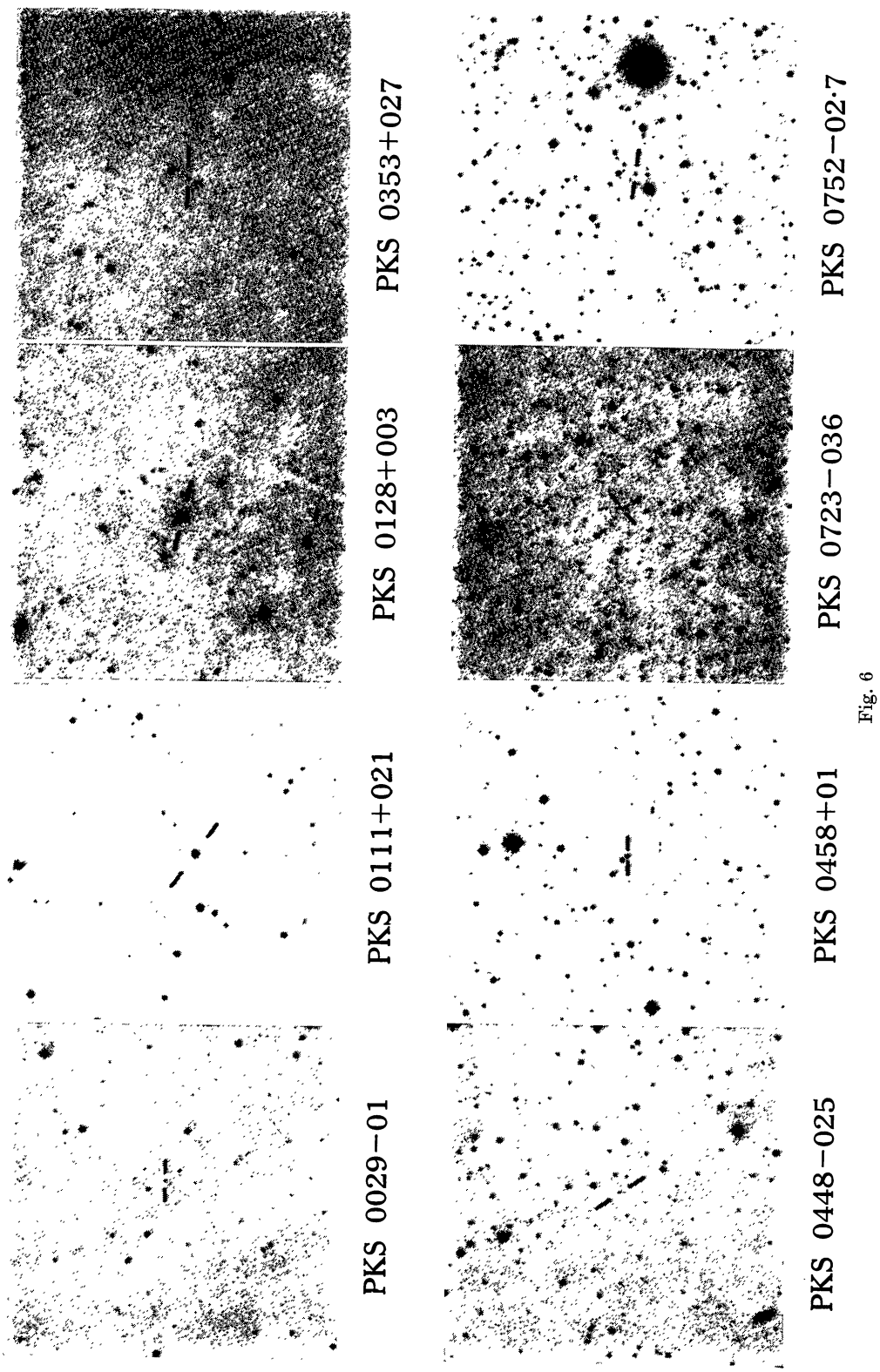


Fig. 6

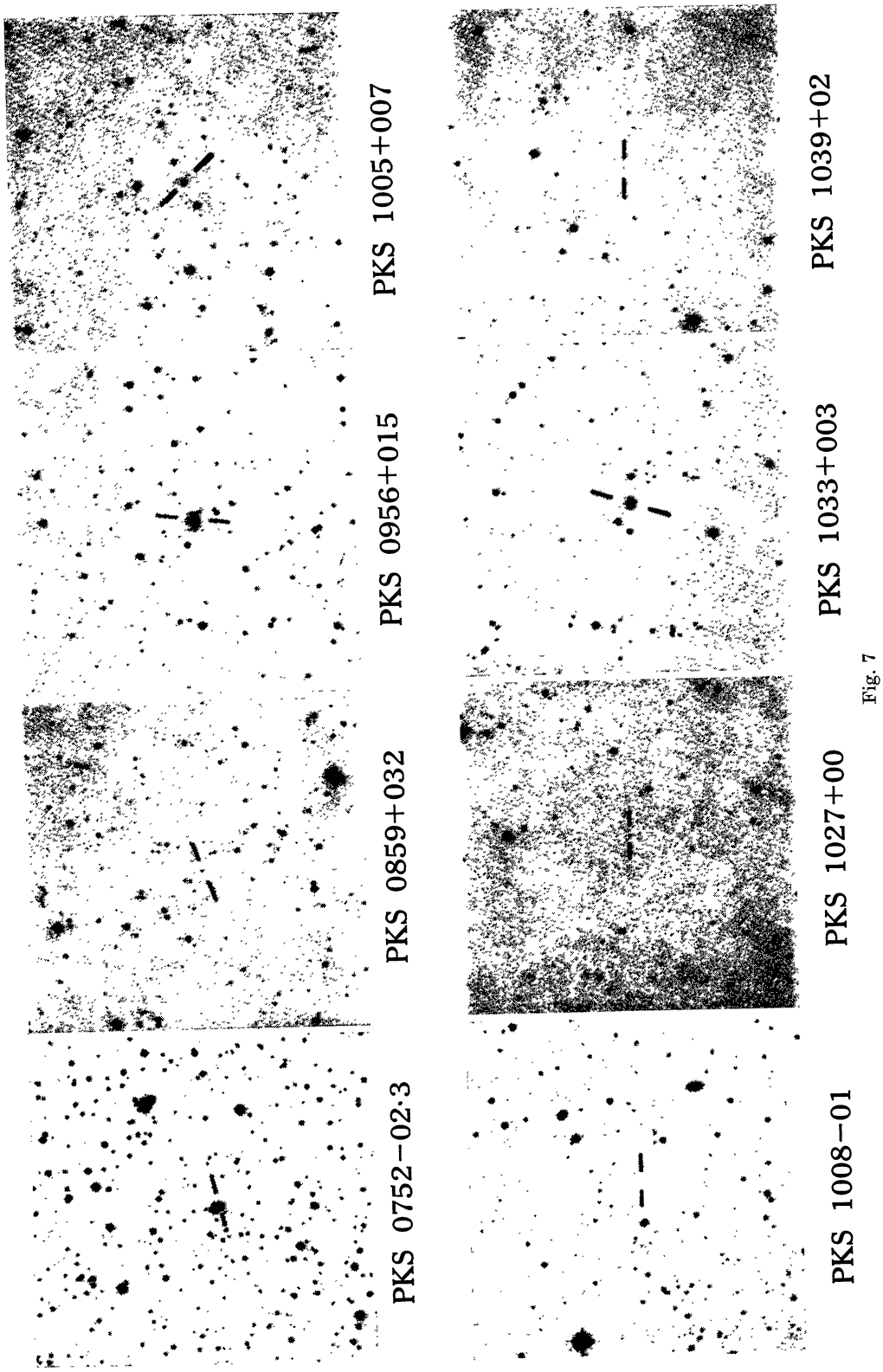


Fig. 7

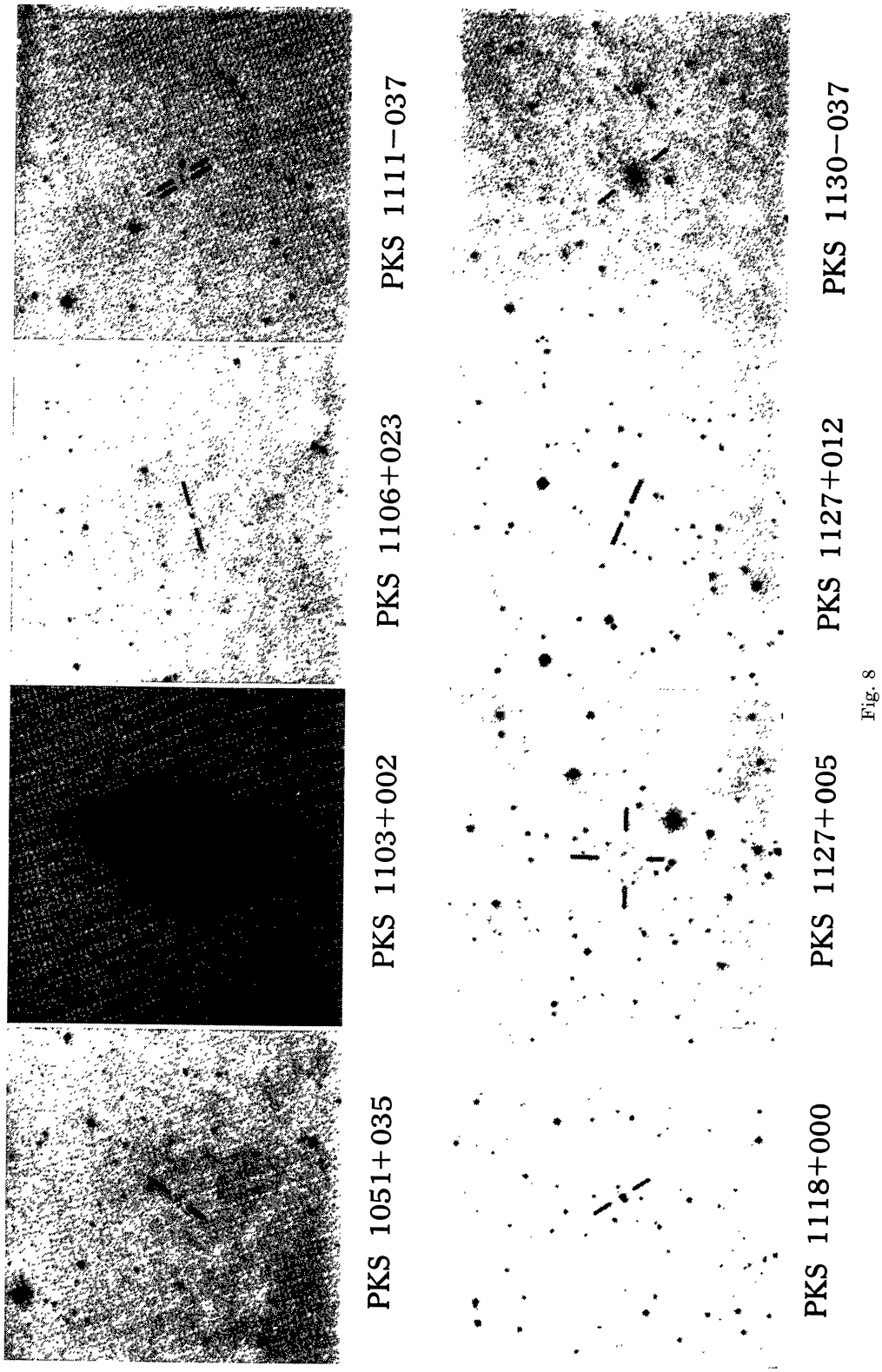


Fig. 8

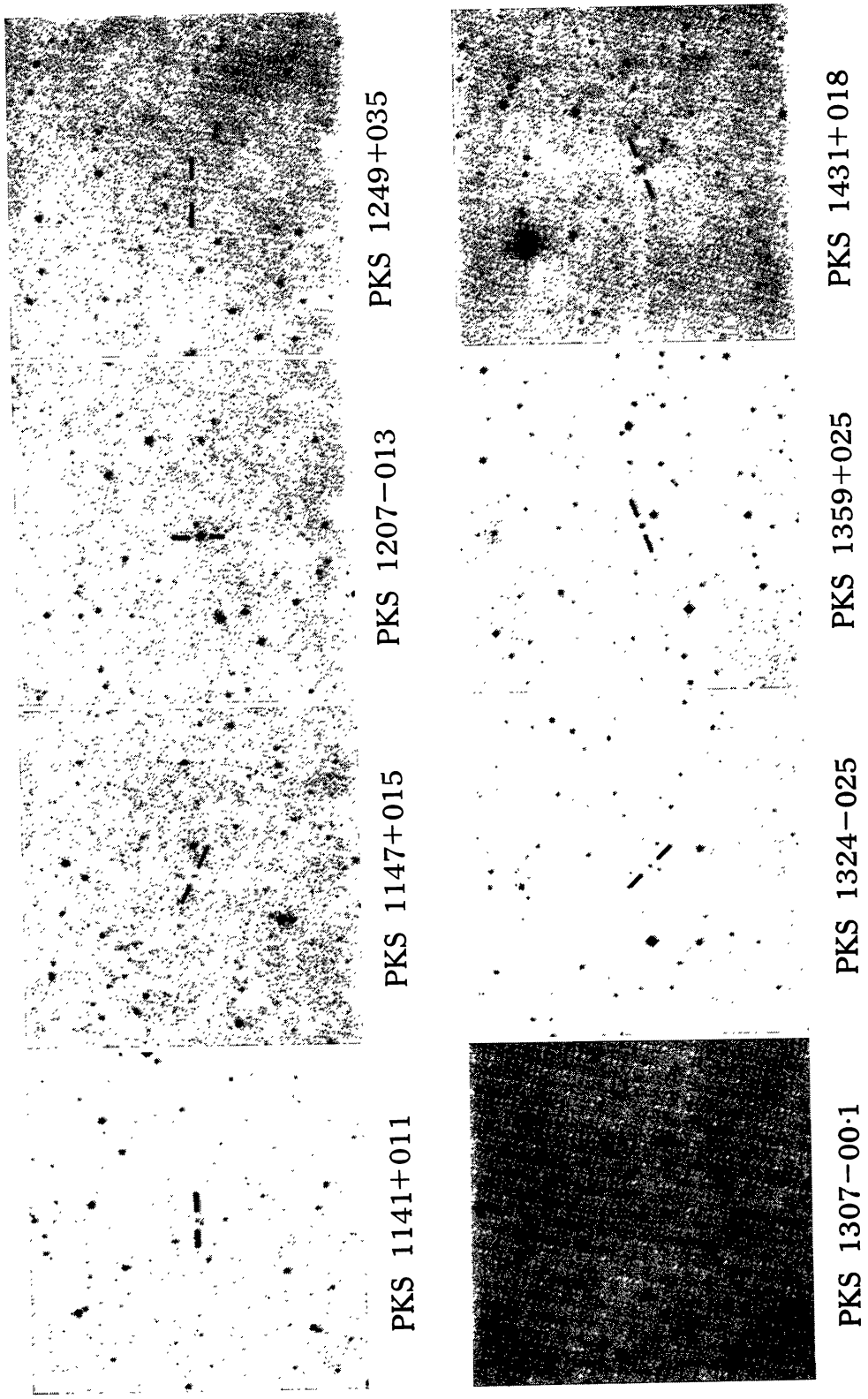


Fig. 9

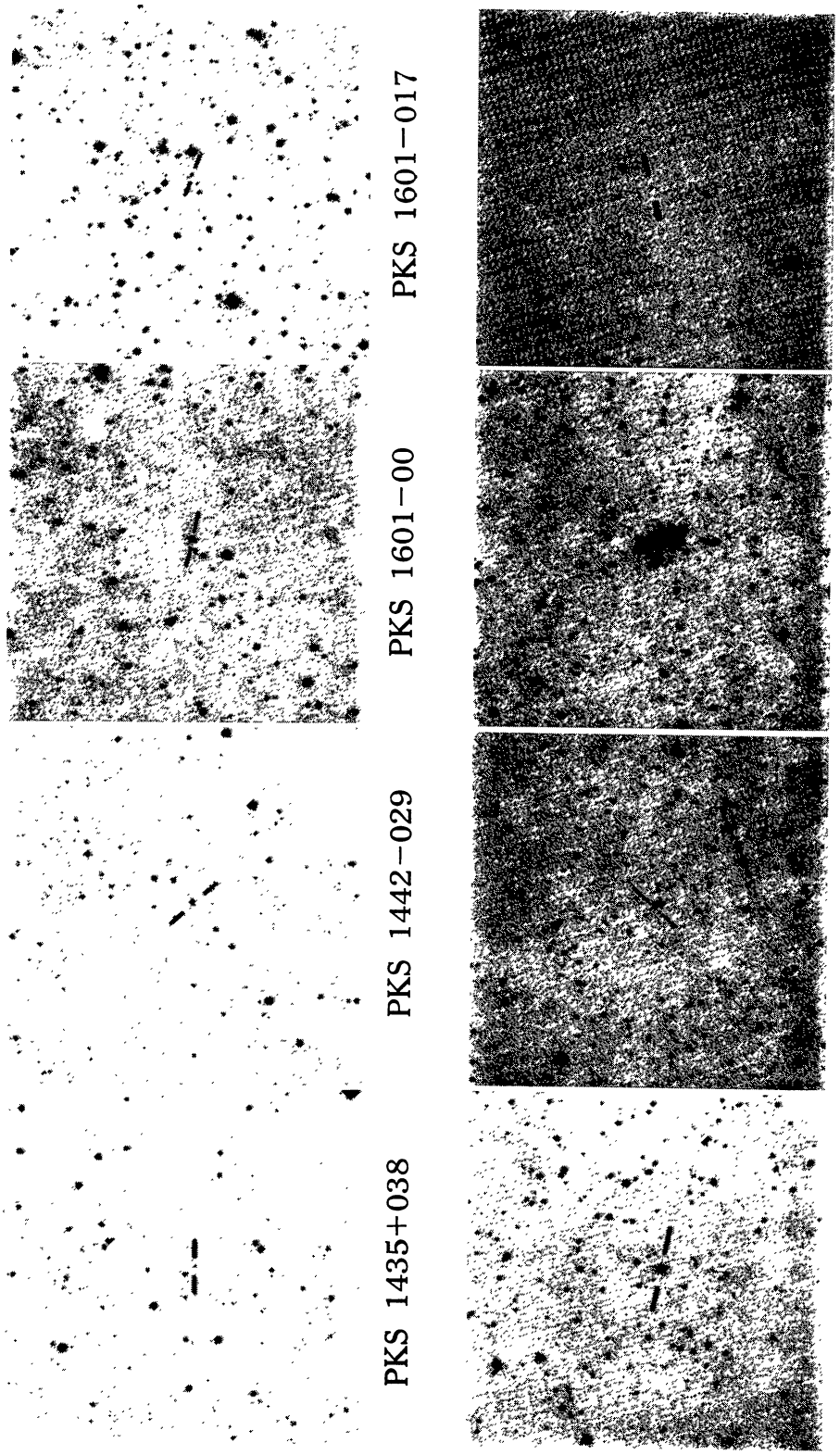


Fig. 10

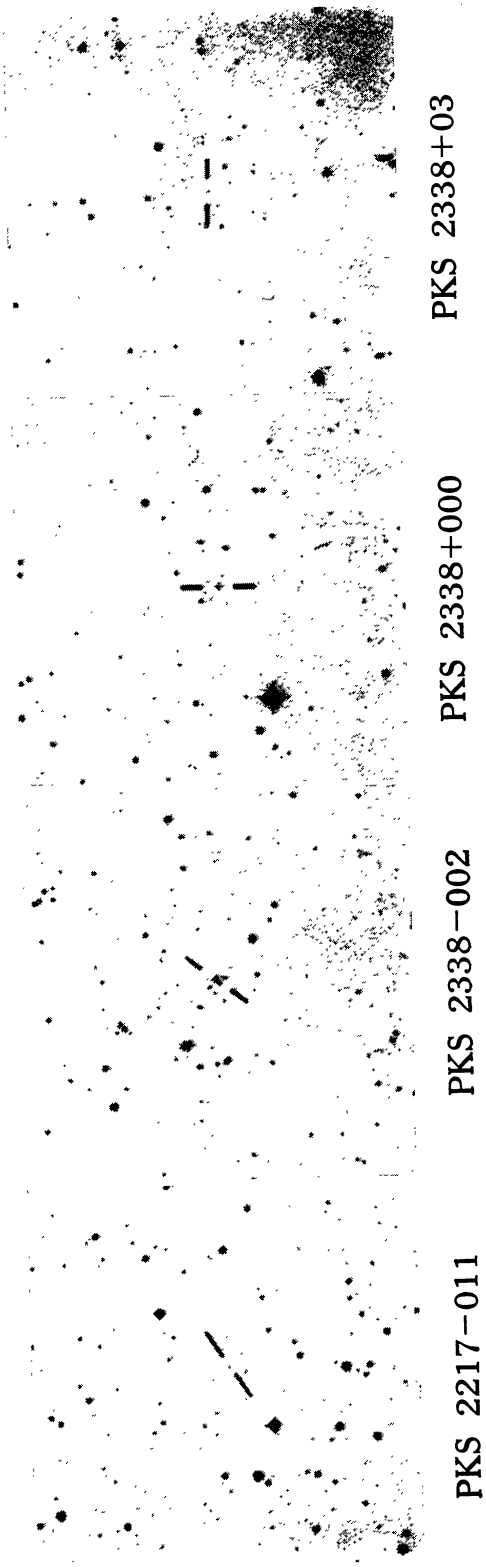


Fig. 11

The results of this investigation will be statistically examined elsewhere. In particular, one of us (J.K.M.) is using them in conjunction with other observations to derive an accurate luminosity function for radio galaxies.

## VI. Acknowledgments

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