A CATALOGUE OF H II REGIONS

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ABSTRACT

A catalogue is given of 313 H II regions north of declination −27°. Known early-type stars associated with them are listed. The apparent distribution of H II regions is discussed, and the galactic pole with respect to ionized hydrogen is determined.

I. INTRODUCTION

In an earlier paper (Paper I, Sharpless 1953) a catalogue was given of H II regions between galactic longitudes 315° and 105° and extending several degrees on either side of the galactic circle. That survey was based on a series of 48-inch Schmidt plates. As the National Geographic–Palomar Sky Atlas became available, the catalogue was continued on the basis of the Sky Atlas prints, and it now covers the entire sky north of declination −27°. These results, incorporating those of Paper I, are presented here. This catalogue is designed to serve as a finding list for radio and optical astronomers as well as a source of diameters and brief descriptions of H II regions.

The term "H II region" (Strömgren 1948) is used here instead of the term "emission nebula." An H II region is an entity defined not only in terms of the ionized gas but also in terms of the hot stars which are responsible for the ionization. It was in accordance with this principle that the present catalogue was assembled. This method of cataloguing requires judgment as to whether several isolated patches of nebulosity belong to the same H II region. Knowledge of the positions of the hot stars responsible for the ionization is usually sufficient to determine this. The distribution of field stars can often reveal the existence of foreground dark lanes which divide an H II region into several apparently detached portions. Those few cases in which an ambiguity still exists are noted as such in the catalogue. An attempt was made to exclude reflection nebulae on the basis of a comparison of the red and blue photographs.

The following sections contain a description of the catalogue, a comparison with previous catalogues, a discussion of the apparent distribution of H II regions, and a determination of the galactic pole with respect to ionized hydrogen.

II. THE CATALOGUE

The catalogue is given in Table 1, the columns of which contain the following information:

Column 1.—A running number. An asterisk here indicates a remark at the end of the table.

Columns 2, 3.—Galactic co-ordinates based on the Lund pole.

Columns 4, 5.—Equatorial co-ordinates for 1900. The position, measured with respect to a nearby BD star, generally refers to the geometric center of the nebula. If the nebula, however, contains large variations in brightness, an attempt was made to give a position more nearly coinciding with the center of light.

Column 6.—Maximum angular diameter. Owing to the diffuse nature of many of these objects, the diameters given here may have an uncertainty of the order of 20 per cent.

Column 7.—Classification as to form (1 = circular, 2 = elliptical, 3 = irregular).

TABLE 1

A CATALOGUE OF HII REGIONS

No.	l	b	R.A.	Dec.	Diam-eter	Form	Struc-ture	Bright-ness	Stars
	°	°	h m	° ′	′				
1*	315.2	+19.0	15 52.8	−25 50	150	3	2	3	1
2	315.3	+ 0.7	16 57.3	−38 00	60	3	2	2	1
3	316.1	− 1.0	17 06.9	−38 23	12	2	3	3	
4	316.1	− 2.5	17 12.9	−39 14	5	2	3	3	
5	316.8	− 2.0	17 13.2	−38 21	100	3	2	2	9
6	317.4	− 0.4	17 08.3	−37 00	4	3	2	3	
7*	317.8	+21.0	15 54.4	−22 40	240	3	2	1	1
8	319.0	− 0.9	17 14.7	−35 56	120	3	3	3	4
9*	319.2	+15.7	16 15.1	−25 21	80	3	2	2	1
10	320.3	+ 0.6	17 12.4	−33 59	60	3	2	2	1
11	321.1	− 0.7	17 19.9	−34 07	90	3	3	3	2
12*	323.5	− 1.5	17 29.4	−32 32	120	1	2	2	9
13	323.7	− 0.0	17 24.0	−31 29	40	2	2	2	1
14	324.8	+ 0.7	17 23.9	−30 11	2	3	1	2	
15	326.2	− 3.5	17 44.1	−31 14	30	2	2	2	3
16	327.6	− 2.0	17 41.5	−29 16	20	3	2	2	
17	327.8	− 1.5	17 39.8	−28 49	25	3	2	2	
18	327.8	− 2.2	17 42.4	−29 13	4	1	2	2	
19	328.0	− 2.2	17 43.0	−29 05	12	1	1	2	
20	328.3	− 1.9	17 42.9	−28 38	10	3	2	2	
21	328.4	− 2.5	17 45.3	−28 52	5	3	2	2	
22	332.1	− 1.2	17 48.9	−25 01	60	3	2	2	5
23	332.2	+28.2	16 08.0	− 8 07	50	3	2	1	
24	333.0	+29.4	16 05.7	− 6 49	30	2	1	2	
25*	333.8	− 3.0	17 59.3	−24 24	90	3	3	3	14
26	334.1	− 1.2	17 52.9	−23 19	20	3	2	1	
27*	334.1	+22.1	16 31.7	−10 22	480	3	2	2	1
28	334.2	− 2.0	17 56.6	−23 35	40	1	2	1	
29*	334.7	− 3.8	18 04.4	−24 01	40	3	2	2	3
30*	334.8	− 1.9	17 57.5	−23 01	20	3	3	3	1
31	335.0	− 3.9	18 05.2	−23 49	8	1	1	2	1
32	335.1	− 3.7	18 04.8	−23 40	8	1	2	2	2
33	336.2	+34.9	15 54.7	− 1 20	35	3	2	1	
34	336.3	− 1.8	18 00.4	−21 40	90	3	2	2	1
35	338.6	− 3.1	18 09.9	−20 17	20	3	1	2	5
36	339.2	+34.9	16 00.4	+ 0 40	45	1	2	1	
37	339.4	− 3.2	18 11.8	−19 42	20	3	2	2	3
38	339.6	− 0.7	18 02.9	−18 17	3	3	2	1	
39*	340.2	− 2.5	18 10.9	−18 41	3	3	1	2	
40	340.4	− 1.1	18 06.2	−17 46	15	3	2	2	
41	340.4	− 2.2	18 10.0	−18 16	90	3	2	2	6
42	341.0	− 0.3	18 04.5	−16 50	3	3	1	2	
43	341.2	− 1.9	18 10.6	−17 26	15	2	1	2	
44	341.8	− 1.6	18 10.7	−16 46	60	3	2	2	2
45*	342.8	− 2.2	18 15.0	−16 13	60	3	3	3	6
46	342.9	+ 1.8	18 00.5	−14 10	25	2	2	2	1
47	342.9	− 1.3	18 12.0	−15 39	5	1	2	2	1
48	344.4	− 1.8	18 16.7	−14 38	10	3	2	2	1
49*	344.5	− 0.7	18 13.0	−14 00	90	3	3	3	10
50	344.6	− 2.6	18 19.8	−14 46	35	3	2	2	1

TABLE 1 (Continued)

A CATALOGUE OF HII REGIONS

No.	l	b	R.A.	Dec.	Diam-eter	Form	Struc-ture	Bright-ness	Stars
	°	°	h m	° ′	′				
51	344.7	− 6.7	18 35.0	−16 39	35	3	1	1	
52*	345.1	−23.7	19 41.8	−23 20	2	2	1	2	
53*	345.9	− 1.8	18 19.6	−13 17	15	3	2	2	
54*	346.4	+ 0.5	18 12.3	−11 46	140	3	3	3	7
55	348.0	− 2.6	18 26.6	−11 50	5	3	2	1	1
56	349.7	− 1.4	18 25.6	− 9 47	7	1	2	1	
57	350.6	− 0.8	18 25.1	− 8 41	2	3	2	1	1
58	350.8	− 0.9	18 26.0	− 8 32	8	3	2	2	
59	352.2	− 1.8	18 31.6	− 7 41	20	3	2	1	
60	353.0	− 1.3	18 31.3	− 6 47	20	3	2	2	
61	354.1	+ 0.3	18 27.6	− 5 05	2	3	2	3	
62	354.5	+ 2.1	18 22.3	− 3 55	4	3	1	1	
63	355.1	−22.4	19 52.1	−14 23	55	3	2	1	
64*	356.7	+ 2.1	18 26.4	− 1 59	25	3	2	2	
65*	356.8	− 2.2	18 41.7	− 3 51	7	3	2	2	
66	358.2	− 1.1	18 40.3	− 2 06	8	3	2	2	
67	358.3	− 2.1	18 44.2	− 2 28	10	2	1	1	
68	358.4	+ 4.8	18 20.1	+ 0 48	8	3	2	2	
69	359.6	− 0.0	18 39.3	− 0 23	20	2	2	2	1
70	2.7	+ 9.9	18 09.8	+ 7 02	5	3	1	2	
71*	3.8	− 2.8	18 57.0	+ 2 01	3	2	2	3	
72	4.1	− 3.1	18 58.8	+ 2 10	25	3	2	2	
73	5.0	+43.1	16 06.8	+22 08	75	3	2	1	
74	7.6	− 2.7	19 03.9	+ 5 27	3	3	2	2	
75	7.9	+ 0.1	18 54.4	+ 6 59	10.	1	2	1	
76	8.1	+ 1.1	18 51.6	+ 7 41	7	1	2	1	
77	8.4	−13.5	19 43.2	+ 0 54	8	2	1	1	
78	14.5	+ 2.5	18 58.6	+13 59	12	1	1	1	
79	16.7	− 1.8	19 18.7	+13 47	40	3	2	1	
80*	17.9	+ 2.0	19 07.0	+16 42	2	3	2	3	
81	19.5	−10.9	19 56.5	+11 31	10	3	1	1	
82	21.3	− 1.2	19 25.9	+18 04	9	3	1	2	1
83	22.8	+ 1.2	19 20.2	+20 36	2	1	2	2	
84	23.6	− 5.0	19 44.6	+18 09	15	3	2	3	2
85	25.0	+ 7.9	18 59.2	+25 41	6	3	2	2	1
86*	27.1	− 1.3	19 38.9	+23 03	40	1	2	2	3
87	28.6	− 1.2	19 42.2	+24 23	10	3	1	1	1
88	29.2	− 0.8	19 41.8	+25 06	25	3	2	2	1
89	30.7	− 1.0	19 45.9	+26 14	5	1	2	1	
90	30.9	− 0.6	19 45.1	+26 37	6	3	2	2	
91*	31.7	+ 3.4	19 31.6	+29 23	120	3	3	2	
92	31.8	+ 0.6	19 42.6	+28 00	50	1	1	1	4
93	31.9	− 1.5	19 50.9	+26 57	1	3	2	3	
94	32.5	+ 5.7	19 24.0	+31 16	25	3	3	1	
95	33.6	− 0.4	19 51.0	+29 02	1	1	2	2	
96	33.7	+ 6.1	19 24.9	+32 29	25	3	2	1	
97	34.6	− 0.1	19 52.1	+30 00	10	1	2	1	
98	35.8	+ 0.0	19 54.8	+31 09	15	1	1	1	1
99	37.8	+ 0.8	19 57.0	+33 13	5	3	2	3	
100	38.0	+ 0.6	19 58.0	+33 14	4	3	2	3	

TABLE 1 (Continued)

A CATALOGUE OF HII REGIONS

No.	l	b	R.A.	Dec.	Diam-eter	Form	Struc-ture	Bright-ness	Stars
	°	°	h m	° ′	′				
101	39.2	+ 1.9	19 56.2	+35 01	20	3	2	2	1
102	39.2	− 6.2	20 27.7	+30 16	40	3	1	1	
103*	42.0	− 9.2	20 46.4	+30 33	210	3	3	3	
104*	42.5	− 0.3	20 14.0	+36 26	7	1	2	2	
105*	43.1	+ 1.6	20 08.4	+38 03	18	2	3	3	1
106	44.1	− 1.4	20 23.7	+37 04	3	3	2	3	
107	45.2	− 4.5	20 38.9	+35 59	5	2	2	2	1
108*	45.9	+ 1.0	20 19.0	+39 56	180	3	3	3	
109*	47.2	− 0.6	20 30.0	+40 00	1080	2	3	2	
110	47.6	−12.9	21 16.6	+32 02	50	3	2	1	
111	49.3	−17.7	21 37.5	+29 39	90	3	1	1	
112	51.4	+ 2.6	20 30.5	+45 19	15	1	2	2	1
113	51.6	− 8.9	21 16.8	+37 40	15	3	1	1	
114	52.1	− 8.5	21 17.2	+38 17	9	3	3	2	
115	52.5	+ 3.3	20 31.3	+46 32	50	3	2	2	
116*	52.6	+ 3.9	20 29.1	+47 01	2	1	2	2	
117*	53.2	− 1.6	20 55.2	+43 56	240	3	3	2	1
118	55.4	− 9.5	21 33.0	+39 46	480	3	2	1	
119	55.4	− 4.4	21 14.7	+43 31	160	2	2	3	1
120	57.9	+ 1.5	21 00.5	+49 29	1	1	1	1	
121	57.9	+ 1.2	21 01.9	+49 15	1	3	2	1	
122	58.1	−41.6	23 03.8	+14 23	40	3	2	1	
123	59.0	− 6.8	21 38.5	+44 05	13	2	2	2	
124	62.2	− 1.9	21 34.8	+49 54	70	1	2	2	
125	62.3	− 5.9	21 49.7	+46 48	9	2	2	3	1
126*	63.5	−17.2	22 29.0	+38 04	160	3	2	2	1
127	63.9	+ 2.2	21 25.5	+54 11	2	3	2	2	
128	65.1	+ 2.8	21 29.0	+55 25	1	3	2	3	
129*	66.0	+ 7.7	21 09.2	+59 33	140	3	2	2	1
130	66.2	+12.4	20 41.2	+62 52	3	3	2	2	1
131*	66.9	+ 3.5	21 35.9	+57 02	170	1	2	2	5
132*	70.5	− 0.8	22 15.1	+55 38	90	3	3	2	3
133	70.5	+ 9.4	21 26.7	+63 52	80	3	1	1	
134*	71.5	+ 2.4	22 08.1	+58 55	160	3	2	2	1
135	72.3	+ 1.1	22 18.6	+58 14	15	3	2	2	
136	72.4	+13.1	21 15.0	+67 50	5	3	2	3	
137	73.1	+ 7.7	21 54.4	+64 13	90	3	2	1	2
138	73.3	+ 0.2	22 28.9	+57 58	1	3	2	2	
139	73.5	− 0.1	22 31.2	+57 42	10	3	2	1	
140	74.3	+ 5.2	22 15.9	+62 47	30	2	2	3	1
141	74.4	+ 3.2	22 25.0	+61 08	5	1	1	2	
142*	74.9	− 1.0	22 43.6	+57 32	30	3	3	3	3
143	75.0	− 1.5	22 46.2	+57 11	4	3	1	1	
144	75.4	+ 0.8	22 41.0	+59 22	4	3	2	1	
145	75.5	+ 5.7	22 22.3	+63 48	90	2	2	1	
146	75.9	+ 0.5	22 45.5	+59 24	2	3	2	2	
147	76.0	− 1.1	22 51.4	+57 56	2	1	1	1	
148	76.1	− 1.1	22 52.1	+57 59	2	3	2	3	
149	76.1	− 1.1	22 52.3	+58 00	1	1	1	2	
150	76.4	+ 6.1	22 27.9	+64 36	40	3	2	2	

TABLE 1 (Continued)

A CATALOGUE OF HII REGIONS

No.	l	b	R.A.	Dec.	Diam-eter	Form	Struc-ture	Bright-ness	Stars
	°	°	h m	° ′	′				
151	76.4	− 2.8	22 58.8	+56 32	20	3	1	1	1
152	76.5	− 1.0	22 54.5	+58 15	2	3	2	3	
153	76.5	− 1.1	22 55.1	+58 12	5	1	2	2	
154	76.6	+ 1.6	22 47.5	+60 39	60	3	2	2	
155*	77.8	+ 2.6	22 52.8	+62 05	60	3	2	2	9
156	77.8	+ 0.1	23 01.0	+59 43	2	1	2	3	
157*	79.0	− 0.6	23 11.7	+59 30	90	3	3	3	5
158	79.2	+ 0.9	23 09.4	+60 58	10	2	3	3	
159	79.3	+ 0.4	23 11.4	+60 36	7	3	2	2	
160	79.5	+ 4.1	23 01.8	+64 08	80	3	2	1	3
161	79.5	+ 1.1	23 11.2	+61 19	55	2	2	2	
162*	79.9	+ 0.3	23 16.3	+60 39	40	3	3	3	2
163	81.3	− 0.6	23 28.7	+60 14	10	3	2	2	
164	81.7	− 1.5	23 33.7	+59 25	3	3	2	2	
165	82.3	+ 0.3	23 35.1	+61 23	10	2	2	2	1
166	82.3	− 0.7	23 37.4	+60 25	10	1	1	1	1
167	82.6	+ 3.3	23 30.8	+64 18	2	1	1	1	
168	83.5	− 1.4	23 48.1	+59 55	7	2	2	2	
169	83.6	− 1.6	23 49.0	+59 49	5	1	1	1	1
170	85.3	+ 2.5	23 56.6	+64 04	20	1	2	2	1
171*	86.0	+ 4.9	23 59.5	+66 36	180	3	2	3	3
172	86.4	− 1.1	0 10.2	+60 42	1	2	1	1	
173	87.2	− 0.7	0 16.4	+61 11	30	1	2	2	1
174	87.5	+18.7	23 42.6	+80 23	10	3	2	1	
175	88.0	+ 2.2	0 21.7	+64 09	2	1	2	2	
176	88.1	− 5.2	0 26.1	+56 44	10	3	2	1	
177	88.3	− 0.0	0 25.9	+61 55	40	3	1	1	2
178	88.4	+25.6	22 34.1	+87 15	420	3	2	1	
179	89.4	+ 0.3	0 34.6	+62 19	1	1	1	1	
180	90.3	+ 0.4	0 42.8	+62 23	15	3	1	1	
181	90.3	+ 2.7	0 43.2	+64 40	15	3	1	1	
182	90.5	+ 2.2	0 44.2	+64 12	2	3	1	1	
183	90.8	+ 3.2	0 47.8	+65 10	35	3	2	1	
184*	91.0	− 5.9	0 47.0	+56 04	40	3	2	3	1
185*	91.7	− 1.5	0 53.9	+60 27	120	3	2	2	1
186	92.6	+ 0.7	1 02.5	+62 36	1	3	2	2	
187	94.4	− 0.4	1 16.6	+61 20	10	3	3	2	
188*	95.9	− 3.7	1 24.2	+57 51	9	3	3	2	
189	99.2	+ 3.2	2 04.6	+63 42	2	1	1	1	
190*	102.5	+ 1.6	2 25.8	+61 00	150	3	3	3	8
191	103.6	+ 0.1	2 29.2	+59 12	2	3	1	3	
192	103.7	+ 2.8	2 39.4	+61 34	1	2	1	1	
193	103.8	+ 2.8	2 39.7	+61 35	2	2	1	1	
194	103.8	+ 2.7	2 39.5	+61 31	2	2	1	2	
195	104.0	+ 0.3	2 32.6	+59 13	3	3	1	1	
196	104.0	+ 3.2	2 43.4	+61 49	4	1	1	2	
197	104.2	+ 0.4	2 34.4	+59 13	5	3	2	1	
198	105.1	+ 0.9	2 42.4	+59 17	9	2	2	2	
199*	105.2	+ 1.8	2 46.8	+60 00	120	3	2	3	9
200	105.7	+ 4.8	3 02.5	+62 26	6	2	2	1	1

TABLE 1 (Continued)

A CATALOGUE OF HII REGIONS

No.	l	b	R.A.	Dec.	Diameter	Form	Structure	Brightness	Stars
	°	°	h m	° ′	′				
201	106.1	+ 2.4	2 55.3	+60 05	5	3	2	3	
202	108.2	+ 2.7	3 10.9	+59 16	170	3	2	1	8
203	111.2	− 1.0	3 14.5	+54 31	45	1	2	1	
204	113.4	+ 3.8	3 47.7	+57 08	40	3	2	2	
205*	116.2	+ 0.7	3 48.5	+52 54	120	3	2	2	1
206	118.3	+ 0.0	3 55.7	+51 03	50	3	2	3	1
207	118.9	+ 3.1	4 12.3	+52 54	4	1	2	2	
208	119.0	+ 3.0	4 12.0	+52 44	1	1	2	3	
209	119.3	+ 0.7	4 03.5	+50 54	14	3	2	2	
210	120.4	+ 3.9	4 23.2	+52 20	20	3	1	2	
211	122.3	+ 3.5	4 29.3	+50 44	2	3	2	3	
212	123.1	+ 3.6	4 33.0	+50 11	5	1	2	3	
213*	124.8	− 2.5	4 13.6	+44 41	1	3	2	1	
214	125.4	− 2.8	4 14.5	+44 08	4	1	1	1	
215	126.1	− 4.6	4 10.6	+42 22	2	3	2	2	
216	126.3	+ 1.9	4 37.6	+46 38	80	3	2	2	1
217	126.8	+ 4.4	4 51.3	+47 51	9	2	2	2	
218	127.0	+12.4	5 33.3	+52 08	70	2	1	1	
219	127.0	+ 3.7	4 48.7	+47 14	3	2	2	3	
220*	128.0	−11.1	3 54.1	+36 20	320	3	2	3	1
221	128.4	+ 3.8	4 54.3	+46 12	120	3	2	1	
222	133.2	− 7.8	4 23.6	+35 03	6	3	2	3	
223	133.4	+ 3.7	5 10.1	+42 06	70	3	2	2	
224	133.8	+ 5.7	5 20.1	+42 53	30	3	3	2	1
225	135.7	+ 4.3	5 20.0	+40 32	10	3	2	2	
226	136.2	+ 0.3	5 04.3	+37 52	3	3	2	3	
227	136.4	+ 2.3	5 13.0	+38 51	20	3	2	2	
228	136.9	+ 0.4	5 06.8	+37 20	8	3	2	3	
229*	139.7	− 0.9	5 09.7	+34 21	65	3	2	3	1
230*	140.7	+ 0.0	5 15.9	+34 02	300	3	2	2	
231	141.0	+ 3.9	5 32.6	+35 52	12	3	1	2	
232	141.1	+ 4.6	5 35.7	+36 09	40	2	2	2	2
233	141.1	+ 3.7	5 32.0	+35 44	2	3	2	2	
234*	141.1	+ 1.2	5 21.5	+34 21	12	3	2	3	4
235	141.3	+ 4.1	5 34.3	+35 48	10	3	2	3	
236*	141.3	− 0.4	5 16.0	+33 16	55	3	2	3	5
237	141.6	+ 1.6	5 24.8	+34 12	7	3	2	3	1
238*	144.1	−19.6	4 16.0	+19 18	1	3	2	3	
239	146.8	−18.7	4 25.5	+17 54	5	3	2	2	
240*	147.9	+ 0.1	5 34.7	+28 03	180	1	3	2	
241	148.6	+ 5.5	5 57.7	+30 15	10	3	2	3	
242	150.1	+ 1.6	5 45.6	+26 59	7	1	2	2	
243	151.8	− 2.7	5 33.3	+23 14	6	3	2	1	
244*	152.3	− 4.4	5 28.5	+21 53	5	2	3	3	
245	154.3	−32.9	3 57.3	+ 3 51	720	3	2	2	2
246	154.8	−15.1	4 56.5	+13 57	65	3	1	1	
247	156.6	+ 2.3	6 02.5	+21 38	9	1	1	2	1
248*	156.7	+ 4.3	6 10.6	+22 32	50	2	3	3	4
249	156.7	+ 5.5	6 14.9	+23 08	80	3	2	2	6
250	157.4	−23.4	4 34.8	+ 7 10	10	3	2	1	

TABLE 1 (Continued)

A CATALOGUE OF HII REGIONS

No.	l	b	R.A.	Dec.	Diam-eter	Form	Struc-ture	Bright-ness	Stars
	°	°	h m	° ′	′				
251	157.7	−25.7	4 27.5	+ 5 39	35	3	3	1	
252*	157.7	+ 2.0	6 03.7	+20 31	40	3	2	3	1
253	159.9	+ 5.1	6 19.8	+20 05	5	3	1	1	
254	160.2	+ 1.3	6 06.5	+18 04	11	2	2	2	1
255	160.3	+ 1.5	6 07.3	+18 00	3	1	2	3	
256	160.3	+ 1.4	6 06.8	+17 58	1	3	2	2	
257	160.3	+ 1.4	6 07.0	+18 00	3	1	2	3	
258	160.4	+ 1.5	6 07.7	+17 57	1	3	2	2	
259	160.6	+ 0.9	6 05.8	+17 28	2	1	1	1	
260	161.2	−21.2	4 49.8	+ 5 30	22	3	3	1	
261	161.8	− 0.5	6 03.2	+15 49	45	3	2	2	1
262	162.4	−18.5	5 01.4	+ 6 02	20	3	2	1	
263	162.4	−14.1	5 16.3	+ 8 18	22	2	2	2	1
264*	162.8	−10.5	5 29.7	+ 9 52	390	1	1	2	9
265	162.8	−15.3	5 13.2	+ 7 20	70	3	2	2	
266*	163.4	+ 1.4	6 13.1	+15 19	1	2	2	3	
267	163.9	+ 0.3	6 10.2	+14 18	4	1	1	2	
268	164.1	− 1.4	6 04.6	+13 21	60	3	1	1	
269	164.2	− 0.2	6 08.9	+13 51	4	3	2	3	
270	164.5	− 1.6	6 04.6	+12 50	1	3	2	3	
271	165.5	− 0.8	6 09.3	+12 23	2	1	2	3	
272	165.5	− 0.8	6 09.4	+12 22	1	2	1	2	
273*	170.6	+ 3.7	6 35.3	+10 00	250	3	2	3	11
274*	172.9	+15.7	7 23.5	+13 28	8	3	3	3	
275*	174.0	− 0.6	6 26.4	+ 5 00	100	1	2	3	9
276*	174.4	−19.0	5 22.5	− 4 03	1200	2	2	2	
277	174.6	−15.3	5 35.7	− 2 30	120	3	2	3	1
278	175.0	−21.5	5 14.9	− 5 46	50	3	2	2	
279	176.1	−17.6	5 30.4	− 4 52	20	3	2	3	1
280	176.4	− 1.2	6 29.1	+ 2 37	40	3	2	2	4
281*	176.7	−18.0	5 30.0	− 5 32	60	3	2	3	3
282	177.7	− 0.8	6 32.8	+ 1 36	35	3	2	2	1
283	178.5	− 1.1	6 33.3	+ 0 48	3	3	1	1	
284	179.7	+ 0.1	6 39.9	+ 0 20	80	2	2	2	
285	181.5	+ 2.1	6 50.1	− 0 23	1	1	2	3	
286	185.0	+ 0.1	6 49.6	− 4 23	6	2	1	1	
287	185.8	+ 1.0	6 54.6	− 4 40	12	3	2	2	
288	186.4	+ 3.2	7 03.6	− 4 09	1	3	2	3	
289	186.5	− 3.1	6 41.1	− 7 14	11	2	1	1	1
290*	187.1	+32.7	8 48.8	+ 9 18	17	2	2	2	
291	188.2	− 1.4	6 50.6	− 7 54	8	2	1	2	
292*	191.4	− 0.5	6 59.7	−10 18	21	3	2	3	1
293	191.9	− 1.5	6 57.1	−11 10	11	1	1	2	1
294	191.9	+ 2.6	7 11.8	− 9 16	7	3	2	3	
295	192.1	− 1.4	6 58.0	−11 19	8	1	1	1	1
296	192.2	− 0.6	7 01.1	−11 04	200	3	2	3	10
297*	193.2	− 1.2	7 00.6	−12 11	7	3	2	3	1
298*	195.5	+ 1.2	7 14.0	−13 01	22	3	3	3	1
299	198.7	+ 2.8	7 26.1	−15 05	1	3	1	1	
300	198.9	+ 2.8	7 26.5	−15 12	3	2	1	1	

TABLE 1 (Continued)

A CATALOGUE OF HII REGIONS

No.	l	b	R.A.	Dec.	Diam-eter	Form	Struc-ture	Bright-ness	Stars
	°	°	h m	° ′	′				
301	199.1	− 3.1	7 05.4	−18 19	9	2	2	3	
302	200.3	+ 2.1	7 27.2	−16 46	21	2	1	2	4
303	200.9	− 8.2	6 49.8	−22 18	90	2	2	2	
304	201.4	−11.2	6 39.3	−24 02	200	3	2	2	
305	201.5	+ 1.1	7 25.7	−18 19	4	3	2	3	
306	202.0	+ 0.9	7 26.2	−18 54	30	3	2	1	4
307	202.3	+ 2.1	7 31.1	−18 32	6	3	2	3	
308	202.3	− 8.9	6 50.0	−23 49	35	3	3	2	1
309	202.5	+ 1.0	7 27.7	−19 13	12	2	1	2	
310*	204.9	− 5.3	7 08.9	−24 25	480	3	2	2	2
311	210.9	+ 1.4	7 48.2	−26 11	45	3	2	3	2
312*	219.2	+14.0	8 54.8	−25 18	720	3	2	2	
313	272.5	+39.6	12 48.2	−22 19	12	1	2	2	

NOTES TO TABLE 1

1. Source of excitation: π Sco.
7. Source of excitation: δ Sco.
9. Source of excitation: σ Sco.
12. Contains cluster NGC 6383.
25. M8. Appears to be connected with M20. Part of I Sgr association. Contains cluster NGC 6530.
27. Source of excitation: ζ Oph.
29. Appears to be connected with M8.
30. M20. Part of II Sgr association.
39. May be part of III Sgr association.
45. M17. Two detached portions apparently separated by foreground dark lane.
49. M16. Part of I Ser association. Contains cluster NGC 6611.
52. May be planetary.
53. About six detached portions.
54. Part of II Ser association. Contains cluster NGC 6604.
64. Appears to be highly obscured.
65. Contains cluster NGC 6823.
71. May be planetary.
80. May be planetary.
86. NGC 6820. Contains cluster. Part of I Vul association.
91. Very long, thin filament.
103. The Network Nebula in Cygnus.
104. May be part of II Cyg association.
105. NGC 6888. Peculiar filamentary structure. May be part of II Cyg association.
108. γ Cygni Nebula.
109. The Cygnus Nebula. The great size and gross filamentary structure of this nebula set it apart from any known H II region. The filaments, especially in the region illustrated by Minkowski (1955), bear a striking resemblance to the filaments of IC 443 except for the great difference in angular size. Like IC 443, the Cygnus Nebula is also a strong radio source and has high internal motions (Courtes 1955). Evidently this nebula cannot be considered to be a normal H II region.
116. May be planetary.
117. NGC 7000.
126. Part of I Lac association.
129. Part of I Cep association.
131. IC 1396. Part of I Cep association.
132. Part of II Cep association.
134. Isolated patches of nebulosity around λ Cep.
142. Part of II Cep association. Contains cluster NGC 7380.
155. Part of III Cep association.
157. Small, very bright condensation in nebula.
162. NGC 7635. Peculiar elliptical structure near center; similar to No. 298.
171. NGC 7822.
184. NGC 281.
185. γ Cassiopeia Nebula.
188. Crescent-shaped; similar to No. 274.
190. IC 1805.
199. IC 1848.
205. Part of I Cam association.
213. In cluster.
220. NGC 1499. Source of excitation: ξ Per. Part of II Per association.
229. IC 405.
230. Nos. 229 and 234 appear to be superposed on this nebula. May be part of I Aur association.
234. May be part of I Aur association.
236. IC 410. Contains cluster NGC 1893.
238. T Tauri Nebula.
240. Peculiar filamentary nebula. Radio source.
244. The Crab Nebula.
248. IC 443. Highly filamentary; radio source.
252. NGC 2174–75. In I Gem association.
264. Source of excitation: λ Ori.
266. May be planetary.
273. NGC 2264. Appears to be connected with No. 275 by lanes of nebulosity.
274. NGC 2237–38. Crescent-shaped; similar to No. 188.
275. Part of I Mon association. Contains cluster NGC 2244.
276. The Barnard Loop. Several detached portions to NE and SW.
281. NGC 1976, 82. The Orion Nebula.
290. May be planetary.
292. IC 2177. May be connected with No. 296.
297. May be connected with No. 296.
298. Contains peculiar ring structure; similar to No. 162.
310. Incomplete ring. Size uncertain due to southern limitation of Palomar Atlas. Contains cluster NGC 2362.
312. Size uncertain due to southern limitation of Palomar Atlas.

Column 8.—Classification as to structure, ranging from 1 = amorphous to 3 = filamentary.

Column 9.—Classification as to brightness on an arbitrary scale, from 1 = faintest to 3 = brightest.

Column 10.—The number of associated stars as identified in Table 2.

Stars which are associated with these regions and are responsible for their ionization are listed in Table 2. Magnitudes and spectral types are taken from the *Henry Draper Catalogue* or its extensions. Some stars are listed with no spectral type. Most of these were taken from the finding list of OB stars of Nassau and Morgan (1951), while a few of them are central stars in circular H II regions and are probably the exciting stars although no spectra are available. In the case of regions associated with large aggregates of early-type stars, e.g., Orion, only a partial list of associated stars is given.

III. PREVIOUS CATALOGUES

Table 3 contains descriptions of previous Hα surveys. The first column gives the reference to the investigation. The next four columns describe the equipment and the spectral region employed for comparison with the Hα plates. Succeeding columns give the interval of galactic longitude covered by the investigation, the number of entries contained therein, and the symbol used here to designate each catalogue in Table 4. Each of the entries of these catalogues, in the respective region of overlap, has been accounted for in terms of the present catalogue numbers in Table 4.

Most of the previous surveys were compiled on the basis of principles similar to those used here. The close agreement of these catalogues with the one given here attests the validity of the cataloguing procedure, especially in view of the large differences in aperture involved. Many of the H II regions listed in Table 1 were not found in the earlier surveys on account of the smaller apertures employed. In general, those regions missed by the earlier surveys are those having diameters less than 15′ and low surface brightness. A few discrepancies between the present catalogue and earlier ones result from the fact that some of the previous investigations listed occasional planetary nebulae, reddened extragalactic nebulae, or clusters, since the true nature of these objects was not recognizable on the small-scale plates on which they were found. All such objects are properly identified in Table 4 as follows: 1 = reflection nebula; 2 = galactic cluster; 3 = planetary nebula; 4 = globular cluster; 5 = extragalactic nebula; 6 = not visible on Palomar Atlas.

Several regions listed in Paper I are not included in Table 1. These were visible on original 48-inch Schmidt plates but were not found on the prints. These were omitted for the sake of homogeneity of the catalogue.

IV. THE APPARENT DISTRIBUTION OF H II REGIONS

The apparent distribution of H II regions is shown in Figures 1 through 5. The Network Nebula, the Crab Nebula, and IC 443 have been included, although these are not typical H II regions. The larger regions are represented by hatched areas, while the smaller regions, regardless of shape, are represented by circles.

The features of the apparent distribution discussed in Paper I are even better defined here. The decrease in average angular diameter from $l = 315°$ to $l = 5°$ is in keeping with an inner spiral arm (Sagittarius arm) going off in perspective in the direction of Scutum (Morgan, Whitford, and Code 1953); and the increase in angular sizes from $l = 15°$ to $l = 55°$ agrees qualitatively with the curvature of our own spiral arm (Westerhout 1957). The relative scarcity of nebulae between $l = 92°$ and 102°, and between $l = 56°$ and 66°, is indicative of a rather spotty distribution of H II regions in the Perseus arm. The second gap is apparent also in the distribution of OB stars (Nassau and Morgan 1951) and red supergiants (Nassau and Blanco 1954).

TABLE 2

A CATALOGUE OF ASSOCIATED EARLY-TYPE STARS

Nebulae	Star	Mag.	Sp.
1	143018	3.00	B2
2	153919	6.73	Od
5	156468	8.0	B3
	156688	7.14	B3
	157038	6.30	B8p
	323015		B
	323016		B2
	323019		B0
	323025		B0
	323110		B0
	323117		B5
7	143275	2.54	B0
8	319699		B0
	319701		B
	319702		B
	319703		B5
9	147165	3.08	B1
10	156327	9.4	Oa
11	157504	11.8	Oa
	319881		B
12	159176	5.71	Oe5
	317828		B5
	317837		B5
	317842		B5
	317844		B5
	317845		B5
	317846		B5
	317858		B
	317861		B
13	158186	5.81	B3
15	161839	10.2	B5
	161853	8.0	B3
	318406		B0
22	162718	9.0	B0
	162978	6.13	B2
	314700		B5
	314701		B5
	314704		B
25	164794	5.86	Oe5
	164816	7.9	B0
	164865	8.3	B
	164906	9.0	B
	164947	10.0	B5
	165052	6.79	Oe5
	315023		B3
	315024		B5
	315026		B5
	315031		B3
	315032		B5
	315033		B3
	315034		B5
	315035		B3
27	149757	2.70	B0
29	165921	7.7	B0
	166056	9.7	B
	166192	8.9	B5
30	164492	6.91	Oe5
31	166107	7.64	B5
32	166033	9.0	B
	314031		B5
34	165516	6.22	B1
35	167263	6.02	B1
	167379	8.7	B9
	312973		B0
	312974		B5
	312989		B3
37	167722	10.1	B5
	167815	7.59	B2
	313098		B5
41	167336	9.4	B5
	167411	8.6	B3
	167412	9.4	B5
	167478	10.3	B5
	167771	6.37	Oe5
	312875		B0
44	167633	8.7	Oe5
	167657	9.4	B3
45	168163	9.1	B3
	168302	9.9	B5
	168607	8.9	B
	168625	9.2	B
	168726	9.7	B5
	168987	8.3	B
46	165319	8.1	B0
47	−15° 4914		
48	168894	9.7	B
49	167451	7.9	B2
	167497	9.4	B3
	167519	10.1	B
	167543	8.8	B2
	168015	8.9	B8
	168075	8.5	B
	168137	9.4	B
	168183	8.3	B0
	168207	10.1	B0
	168504	9.2	B
50	−14° 5037		
54	167834	9.2	B
	167971	7.34	B0
	168112	8.7	B0
	168206	8.87	Oa
	−11° 4586		

TABLE 2 (Continued)

A CATALOGUE OF ASSOCIATED EARLY-TYPE STARS

Nebulae	Star	Mag.	Sp.
	−12° 4970		
	−12° 4982		
55	−11° 4665		
57	− 8° 4623		
69	173371	6.80	B9
82	231616	10.7	B0
84	187282		Oa
	187323	8.0	B5
85	177347	6.93	B8
86	344775		B
	344776		B
	344783		B
87	338936		B2
88	338916		B
92	186943	9.98	Oa
	332737		B5
	332755		B0
	332757		B5
98	331626		B9
101	227018	9.5	B
105	192163	7.44	Ob
107	197460	8.6	B2
112	+45° 3216		
117	199579	6.01	Oe5
119	203064	5.06	Oe5
125	+46° 3474		
126	214680	4.91	Oe5
129	202214	5.65	B2
130	197911	7.9	B5
131	205196	7.36	B0
	205794	8.7	B8
	205948	8.3	B5
	206267	5.64	Oe5
	206773	6.98	B0p
132	211564	11.07	Oc
	211853	9.0	Ob
	+54° 2726		
134	210839	5.19	Od
137	208682	5.85	B2
	208904	7.60	B3
140	211880	8.5	B8
142	215605	9.5	B
	215806	9.4	B
	215835	8.6	B
151	240171	9.1	B
155	216532	8.0	B3
	216658	8.6	B
	216711	9.4	B
	216898	8.0	B2
	217035	7.76	B5
	217061	8.4	B
	217086	7.70	B0
	217312	7.7	B8
	217463	8.9	B2
157	219286	8.6	B
	219287	8.5	B
	219460	9.2	Oa
	240234	9.1	B0
	240250	8.6	B0
160	218323	7.8	B
	218723	6.62	B5
	219063	7.22	B5
162	220057	6.82	B5
	+60° 2522		
165	+61° 2494		
166	+60° 2607		
169	+59° 2786		
170	+63° 2093		
171	224938	7.30	B9
	+66° 1661		
	+66° 1675		
173	+60° 39		
177	2928	8.7	G
	+61° 105		
184	5005	7.7	B2
185	5394	2.25	B0p
190	15558	7.82	B
	15570	8.0	B
	15629	8.4	B
	+60° 493		
	+60° 497		
	+60° 498		
	+60° 501		
	+60° 512		
199	17505	7.11	B0
	17520	8.7	B
	18326	7.91	B
	237007	9.2	B
	237011	9.4	B
	237012	9.4	B
	237015	9.0	Oe5
	237019	9.3	B
	+60° 586		
200	+62° 524		
202	19441	8.0	B5
	19820	7.09	B5
	20134	7.51	B3
	20898	7.66	B8
	20959	8.2	B5
	237090	9.0	B8
	237091	8.8	B8
	237121	8.3	B2

TABLE 2 (Continued)

A CATALOGUE OF ASSOCIATED EARLY-TYPE STARS

Nebulae	Star	Mag.	Sp.
205	24431	6.70	0e5
206	+50° 886		
216	29997	8.9	B8
220	24912	4.05	0e5
224	+42° 1286		
229	34078	5.81	B0p
232	37737	8.0	B3
	37767	8.4	B5
234	35619	9.0	B0
	35633	8.6	B0
	35652	8.4	B
	35653	7.50	B1
236	242704	9.6	B5
	242855	10.0	B8
	242908	8.7	B0
	242926	9.5	B0
	242935	9.6	B3
237	+34° 1074		
245	25340	5.25	B5
	25558	5.33	B3
247	41690	8.0	B2
248	43078	8.6	B0
	43582	9.0	B8
	254346	9.6	B3
	254577	9.5	B0
249	43703	8.7	B2
	43753	8.1	B1
	43818	7.03	B0
	43836	7.03	B9
	255055	9.1	B0
	255134	9.2	B3
252	42088	7.40	0e5
254	253247	10.0	B2
261	41997	8.5	B
263	34989	5.71	B2
264	36822	4.53	B0
	36861	3.66	0e5
	36862	5.56	0e5
	36881	5.59	B8
	36894	7.7	B9
	36895	7.7	B3
	37035	8.7	B9
	37051	8.9	B9
	245203	7.7	B8
273	45995	5.83	B0
	46005	7.65	B8
	46075	6.46	B8
	46783	7.92	B8
	46883	7.8	B2
	47732	7.79	B8
	47777	7.9	B2
	47839	4.68	0e5
	47887	7.02	B3
	47961	7.27	B5
	48977	5.84	B3
275	46056	7.96	B0
	46149	7.66	B2
	46150	6.80	B2
	46202	8.16	B2
	46223	7.14	B2
	46485	8.3	B2
	46573	8.1	B2
	46966	7.3	B2
	47129	6.06	B0p
277	37742	2.05	B0
279	37018	4.65	B3
280	46559	8.5	B5
	46573	8.1	B2
	46711	8.9	B
	46847	8.9	B
281	37022	5.36	0e5
	37041	5.17	B1
	37043	2.87	0e5
282	47432	6.13	B0
289	48979	6.89	A0
292	53367	7.01	B0
293	52721	6.57	B3
295	52942	8.7	B5
296	53456	7.8	B5
	53755	6.38	B3
	53756	7.20	B5
	53857	8.5	B5
	53948	10.1	B5
	53974	5.28	B3
	53975	6.40	B5p
	54025	8.4	B5
	54306	9.2	B5
	54439	8.5	B8
297	53623	8.5	B9
298	56925		0b
302	59934	7.8	B5
	59960	9.7	B9
	59961	9.1	B8
	59986	9.3	B8
306	59442	9.3	B9
	59548	8.4	B9
	59813	9.1	B3
	60146	9.3	B9
308	50896	6.55	0b
310	57060	4.90	0e
	57061	4.40	0e5
311	64315	8.5	B
	64568	9.7	B

The H II regions between $l = 45°$ and 180° follow the bifurcation of the Orion arm (Morgan, Whitford, and Code 1953; Helfer and Tatel 1955), the nearer branch extending into negative latitudes.

V. THE GALACTIC POLE WITH RESPECT TO IONIZED HYDROGEN

The strong concentration of H II regions toward the plane of the galaxy makes them an ideal type of object on which to base a computation of the co-ordinates of the galactic pole. Since they are extended objects, their discovery is less influenced by interstellar absorption, and a galactic pole based on H II regions can therefore be expected to be less biased by irregular obscuration than a pole based on various types of stars selected to some limiting magnitude.

TABLE 3

PREVIOUS Hα SURVEYS

Reference	Effective Aperture (inches)	f-Ratio	Filter	Comparison Region	Longitude Interval	n	Symbol
Strohmeier (1950)	3.9	1.5	Absorption	Blue	150–200	42	Str.
Sharpless and Osterbrock (1952)	0.1	2.0	Absorption	Red	320–195	16	Y
Sharpless (1953)	48.0	2.44	Absorption	Blue	315–105	142	E
Bok, Bester, and Wade (1954)	3.0	1.5	Interference	6480 A	250–355	41	B
H. M. Johnson (1955)	6.3	1.2	Absorption	Infrared or 6430 A	303–203	184	YM
	5.7	1.35	Interference				
Gase and Shajn (1955)	17.7	1.4	Absorption	Blue	320–195	286	C
Gum (1955)	3.9	1.0	Absorption	Green	190–350	85	G

The following equation of condition was used to determine the small circle which best fits the apparent distribution of H II regions:

$$X \cos b \cos l + Y \cos b \sin l + Z + \sin b = 0 ,$$

where

$$X = \cos B \cos L ,$$

$$Y = \cos B \sin L ,$$

$$Z = p ,$$

and where l and b are the co-ordinates of an H II region relative to a provisional pole, L and B are the co-ordinates of the new pole in the provisional system, and $90° + p$ is the angular distance between the new pole and the best fitting small circle. The conditional equation used here assumes that

$$\sin B = 1 .$$

This simplification is valid, since a close first approximation to the pole is used.

The results of the computations are listed in Table 5 along with the mean errors. The 1959 I.A.U. pole is included for comparison. The two solutions obtained here are described below.

Solution I.—This solution is based on all H II regions of Table 1 having $b < 10°$, and $336° < l < 205°$. All regions were given equal weight. The limitation on b was made so as to reduce the contribution of nearby objects.

Solution II.—Solution I is based only on objects accessible from the northern hemi-

TABLE 4

COMPARISON OF PREVIOUS CATALOGUE DESIGNATIONS WITH THOSE OF TABLE 1

Str – S		Y – S		E – S		E – S		YM – S		YM – S	
1	6	13	49	52	60	111	163	35	4	94	205
2	302	14	25	53	59	112	164	36	6	95	205
3	305	15	27	54	6	113	165	37	45	96	206
4	6	16	12	55	69	114	166	38	45	97	207
5	1			56	66	115	168	39	46	98	211
6	6	E – S		57	65	116	169	40	6	99	212
7	298			58	76	117	170	41	53	100	216
8	294			59	75	118	3	42	54	101	217
9	296	1	2	60	78	119	6	43	4	102	219
10	296	2	3	61	74	120	172	44	56	103	1
11	301	3	6	62	80	121	173	45	58	104	226
12	296	4	10	63	79	122	175	46	59	105	228
13	296	5	4	64	83	123	6	47	60	106	233
14	296	6	5	65	86	124	177	48	64	107	232
15	296	7	8	66	88	125	6	49	65	108	235
16	297	8	11	67	87	126	179	50	66	109	237
17	296	9	14	68	92	127	180	51	68	110	240
18	292	10	13	69	90	128	181	52	69	111	241
19	296	11	12	70	89	129	182	53	71	112	242
20	1	12	17	71	93	130	185	54	4	113	244
21	273	13	16	72	95	131	6	55	3	114	247
22	273	14	18	73	97	132	186	56	82	115	248
23	273	15	20	74	98	133	187	57	86	116	252
24	273	16	19	75	101	134	188	58	88	117	254
25	273	17	15	76	105	135	189	59	90	118	255
26	273	18	21	77	104	136	190	60	92	119	257
27	280	19	22	78	108	137	191	61	93	120	256
28	273	20	26	79	109	138	195	62	95	121	261
29	275	21	28	80	116	139	197	63	97	122	263
30	252	22	30	81	112	140	194	64	101	123	267
31	261	23	25	82	115	141	192	65	103	124	269
32	2	24	34	83	109	142	193	66	104	125	264
33	276	25	46	84	109			67	105	126	272
34	276	26	38	85	109	YM – S		68	109	127	2
35	264	27	29	86	117			69	112	128	6
36	277	28	42	87	120			70	116	129	273
37	277	29	32	88	121			71	119	130	273
38	281	30	31	89	3	10	3	72	125	131	1
39	264	31	40	90	124	13	4	73	124	132	3
40	244	32	35	91	132	14	6	74	129	133	274
41	264	33	41	92	135	15	8	75	147	134	1
42	264	34	43	93	138	16	8	76	152	135	1
		35	44	94	139	17	8	77	153	136	1
		36	1	95	144	18	8	78	156	137	1
Y – S		37	39	96	142	19	9	79	157	138	277
		38	1	97	146	20	11	80	158	139	278
		39	37	98	143	21	11	81	162	140	280
1	296	40	47	99	154	22	11	82	164	141	276
2	276	41	54	100	147	23	11	83	165	142	2
3	275	42	49	101	148	24	12	84	168	143	289
4	264	43	45	102	149	25	13	85	169	144	1
5	236	44	48	103	155	26	15	86	170	145	292
6	229	45	53	104	152	27	16	87	5	146	295
7	220	46	50	105	153	28	18	88	173	147	298
8	199	47	57	106	156	29	17	89	175	148	301
9	190	48	56	107	158	30	19	90	6	149	302
10	131	49	58	108	159	31	29	91	188	150	305
11	117	50	55	109	157	32	31	92	1	151	307
12	54	51	61	110	162	33	37	93	194	152	309
						34	43				

TABLE 4 (Continued)

COMPARISON OF PREVIOUS CATALOGUE DESIGNATIONS
WITH THOSE OF TABLE 1

C – S	C – S	C – S	C – S	C – S	G – S
1 1	60 234	119 8	178 109	237 109	5 301
2 5	61 230	120 11	179 109	238 129	6 302
3 173	62 237	121 12	180 109	239 109	7 307
4 175	63 264	122 4	181 109	240 119	8 310
5 177	64 264	123 22	182 109	241 136	9 311
6 1	65 281	124 28	183 109	242 114	57 2
7 179	66 281	125 30	184 109	243 118	58 3
8 184	67 279	126 25	185 105	244 124	59 5
9 185	68 281	127 4	186 109	245 131	60 6
10 5	69 230	128 46	187 109	246 125	61 8
11 187	70 3	129 34	188 109	247 6	62 8
12 188	71 233	130 29	189 109	248 134	63 8
13 5	72 1	131 42	190 109	249 135	64 8
14 190	73 231	132 4	191 109	250 140	65 9
15 190	74 240	133 40	192 109	251 135	66 11
16 190	75 230	134 35	193 109	252 132	67 12
17 191	76 235	135 41	194 109	253 135	68 13
18 190	77 240	136 43	195 104	254 3	69 15
19 197	78 232	137 44	196 109	255 145	70 16
20 194	79 1	138 39	197 109	256 141	71 22
21 192	80 277	139 1	198 109	257 126	72 25
22 193	81 1	140 37	199 109	258 126	73 27
23 198	82 264	141 54	200 109	259 126	74 28
24 196	83 242	142 49	201 109	260 139	75 29
25 199	84 252	143 49	202 109	261 142	76 30
26 199	85 247	144 45	203 109	262 146	77a 34
27 201	86 261	145 45	204 109	263 143	77b 35
28 5	87 252	146 48	205 109	264 154	78 37
29 202	88 254	147 53	206 109	265 148	79 44
30 5	89 256	148 50	207 109	266 155	80 46
31 1	90 257	149 68	208 109	267 152	81 45
32 5	91 255	150 56	209 116	268 153	82 48
33 5	92 269	151 58	210 109	269 151	83 49
34 205	93 267	152 64	211 109	270 156	84 54
35 5	94 248	153 61	212 112	271 160	85 54
36 206	95 248	154 60	213 109	272 158	
37 220	96 249	155 59	214 109	273 161	
38 5	97 275	156 69	215 109	274 157	B – S
39 209	98 280	157 6	216 109	275 159	
40 6	99 273	158 66	217 109	276 157	
41 208	100 273	159 65	218 109	277 162	31500 2
42 207	101 282	160 3	219 109	278 163	31800 8
43 1	102 273	161 71	220 109	279 164	32100 11
44 210	103 273	162 78	221 103	280 165	32300 13
45 211	104 275	163 82	222 103	281 168	32301 12
46 212	105 1	164 3	223 117	282 171	32603 15
47 1	106 293	165 6	224 103	283 171	32701 18
48 216	107 295	166 86	225 109	284 170	32801 16
49 219	108 296	167 87	226 109	285 171	33201 22
50 217	109 292	168 88	227 103	286 171	33402 {25, 30}
51 226	110 297	169 92	228 103		
52 228	111 296	170 84	229 117		33903 37
53 229	112 288	171 90	230 117	G – S	34101 44
54 229	113 296	172 89	231 103		34201 46
55 236	114 296	173 93	232 103		34202 45
56 263	115 294	174 109	233 109	1 292	34400 49
57 230	116 298	175 101	234 117	2 296	34401 48
58 230	117 310	176 109	235 1	3 297	34600 54
59 230	118 9	177 109	236 117	4 298	35201 60

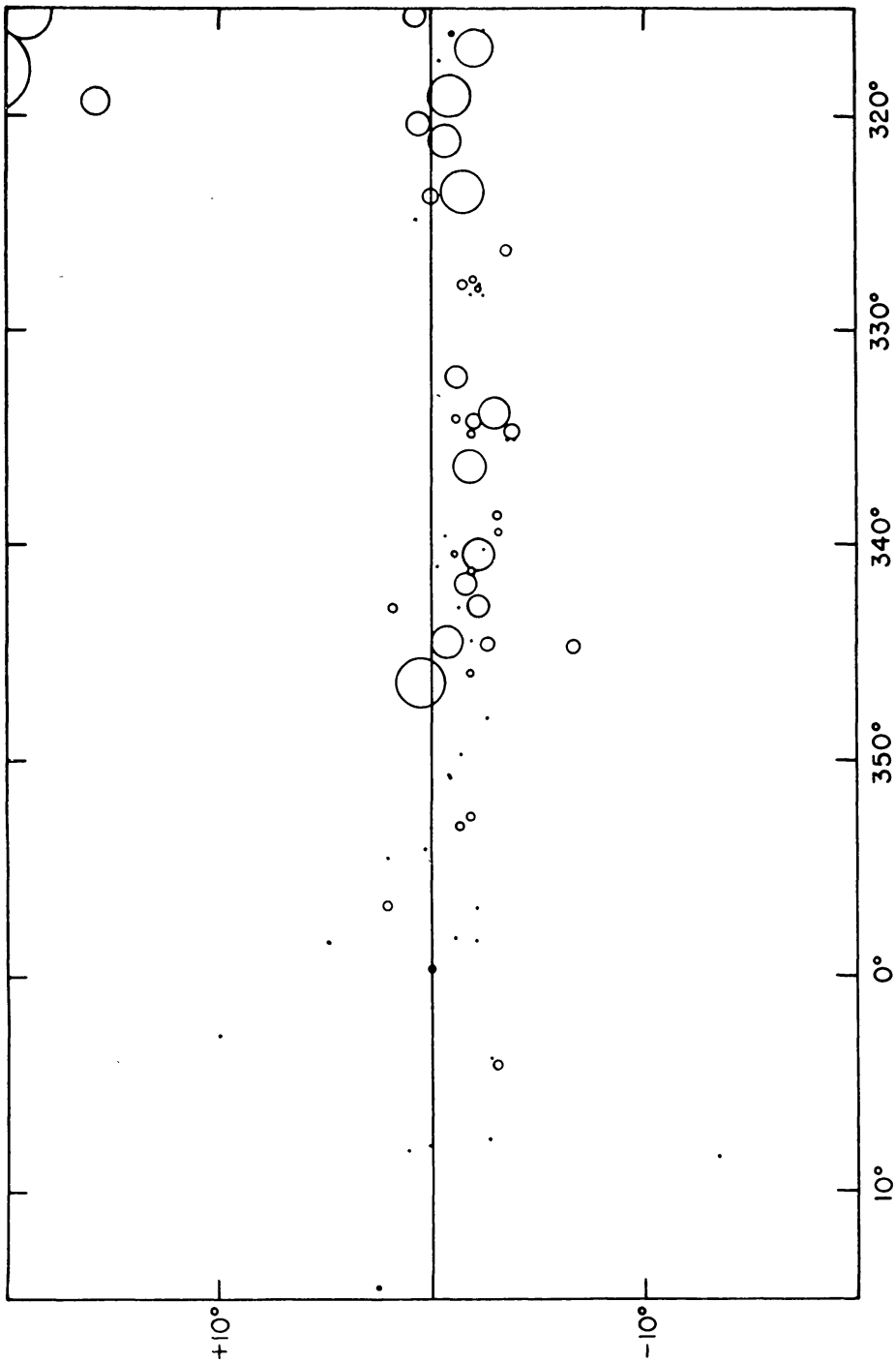

FIG. 1.—The distribution of H II regions between $l = 315°$ and $l = 15°$

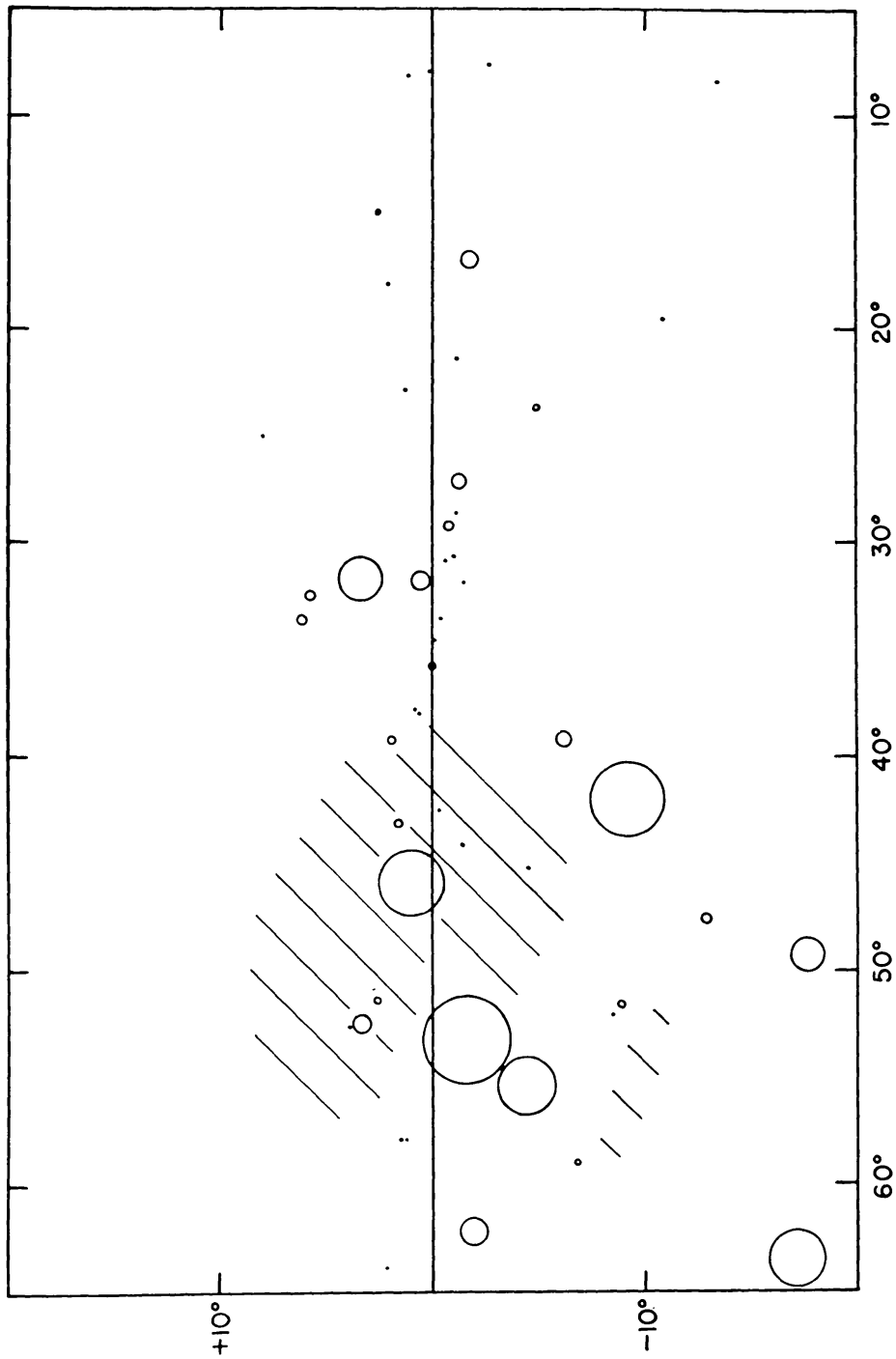

FIG. 2.—The distribution of H II regions between $l = 5°$ and $l = 65°$

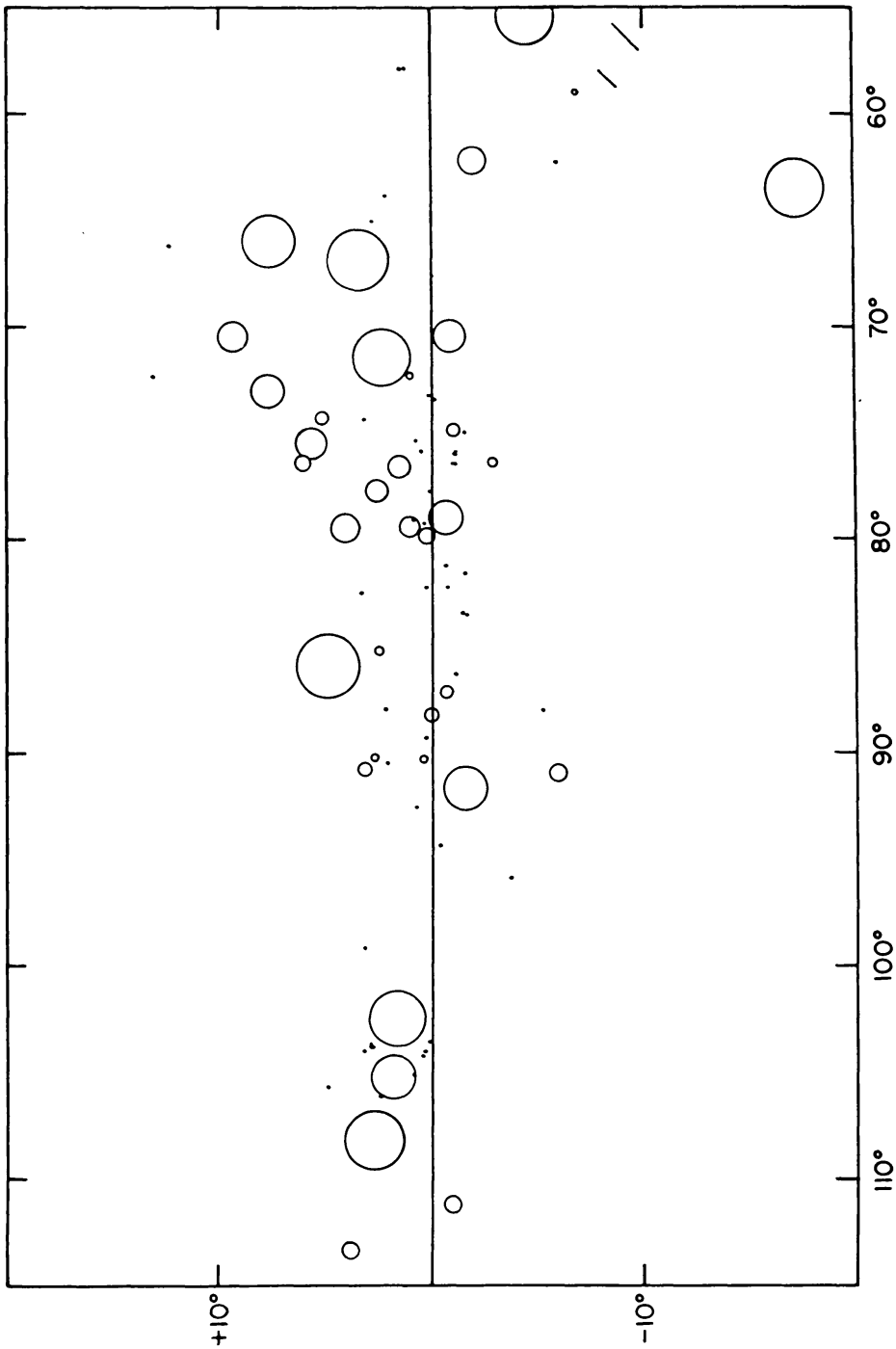

FIG. 3.—The distribution of H II regions between $l = 55°$ and $l = 115°$

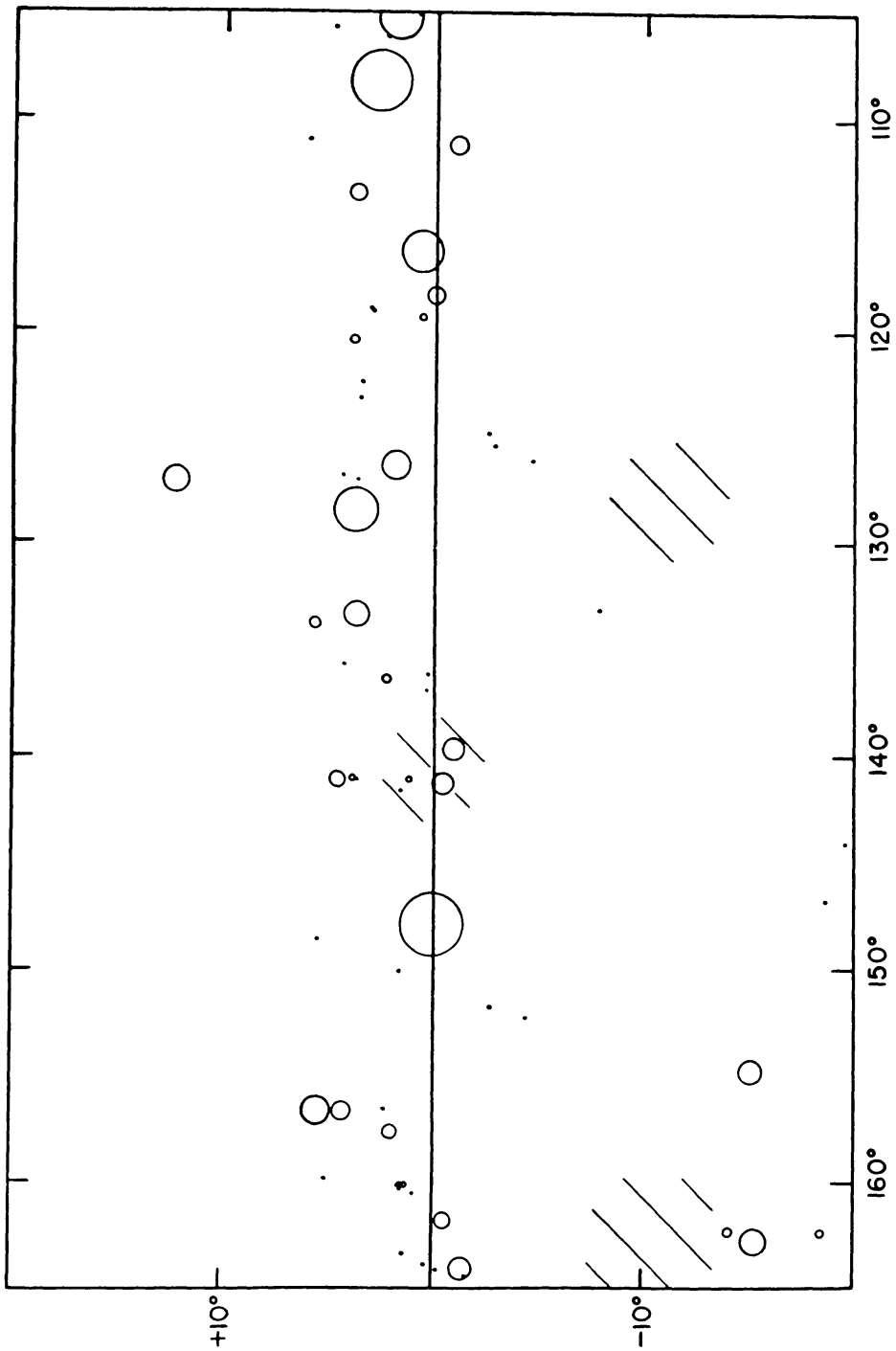

FIG. 4.—The distribution of H II regions between $l = 105°$ and $l = 165°$

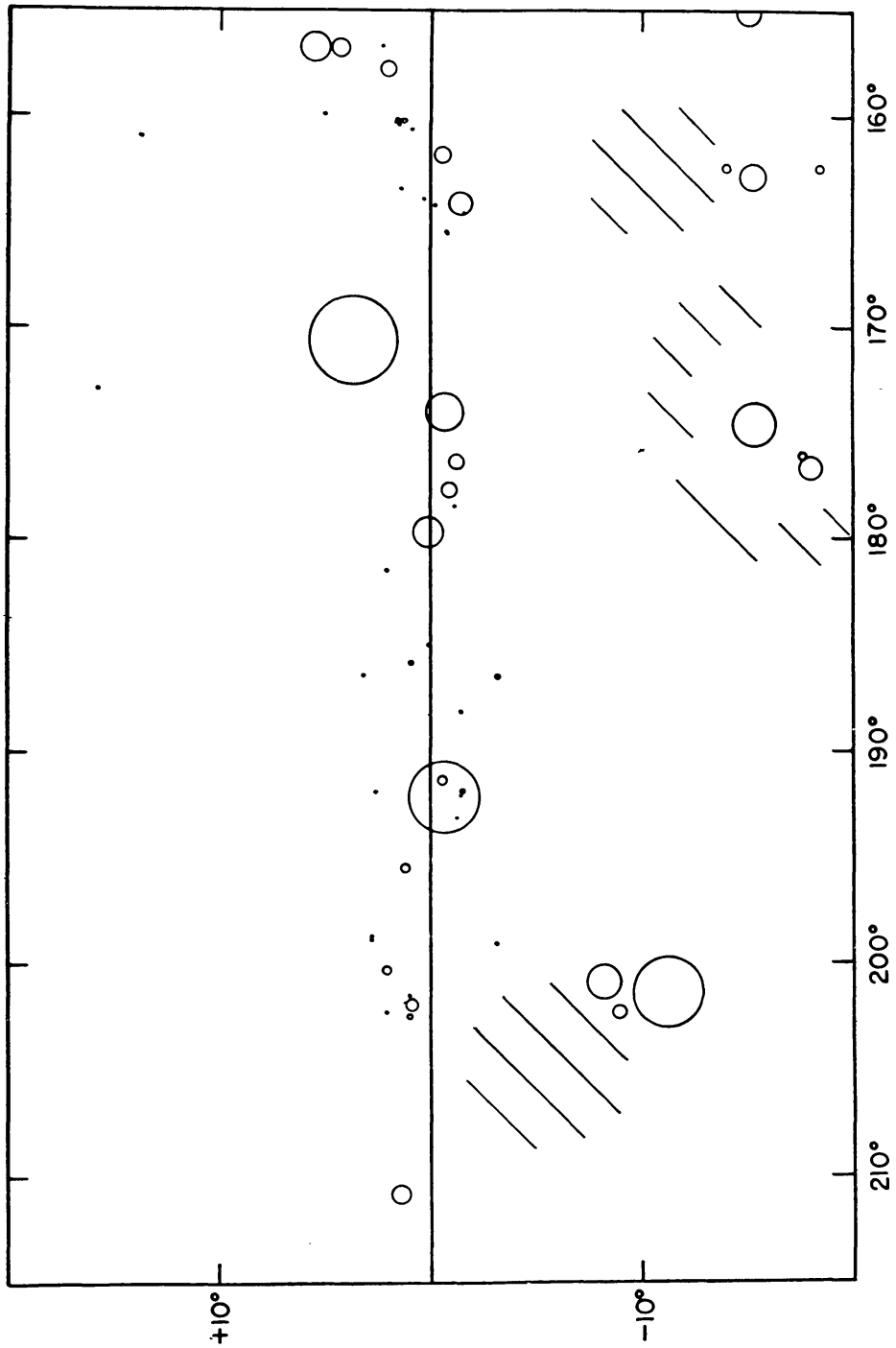

FIG. 5.—The distribution of H II regions between $l = 155°$ and $l = 215°$

TABLE 5

DETERMINATIONS OF THE GALACTIC POLE AND MEAN ERRORS

Solution	L	B	p
Solution I.....	297°±13°	88°.45±0°.34	+0°.33±0°.27
Solution II.....	307°±15°	88°.85±0°.29	+0°.09±0°.20
1959 I.A.U.....	347°.7	88°.51	.....

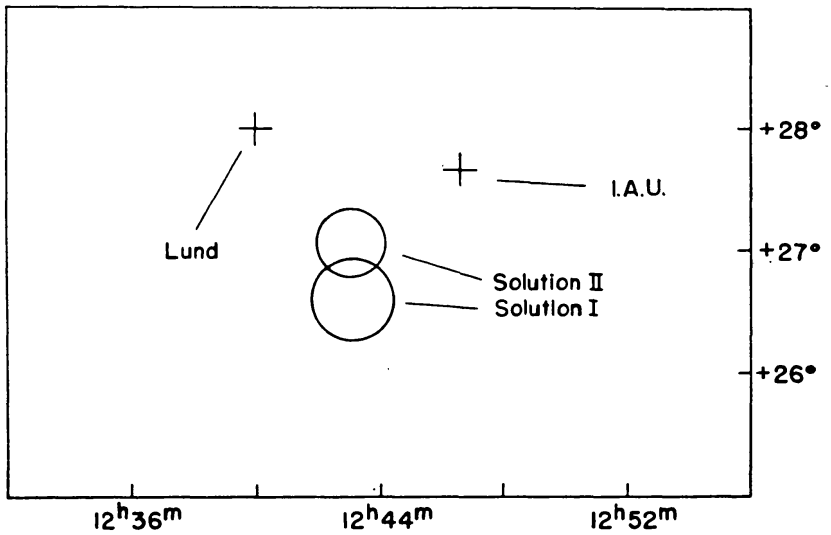

FIG. 6.—Galactic poles plotted in equatorial co-ordinates, epoch 1900

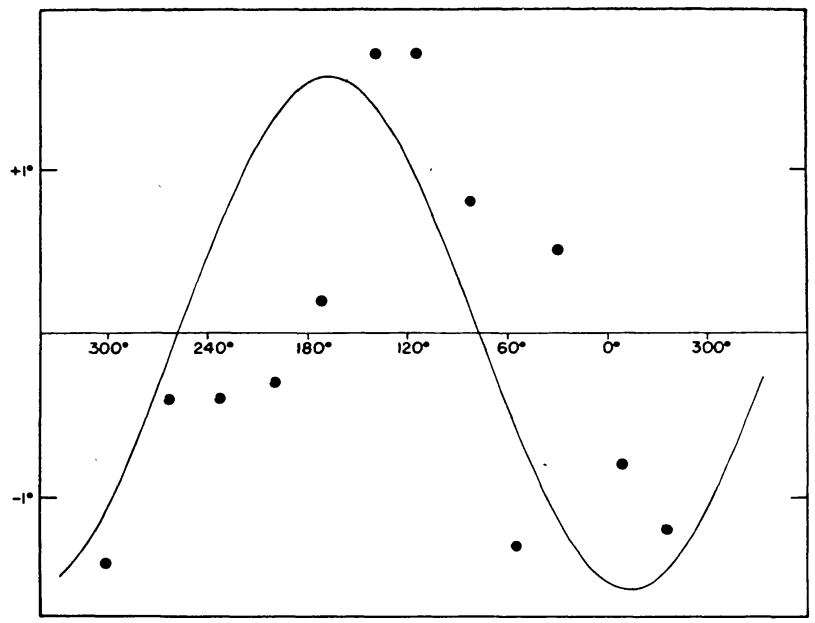

FIG. 7.—The 1959 I.A.U. galactic equator and the normal points of Solution II plotted in the Lund system.

sphere. The results of Gum's (1955) catalogue of southern H II regions were therefore combined with those of Table 1 to obtain a solution covering the entire galactic circle. Between longitudes 336° and 196° the data of Table 1 were used, while between longitudes 196° and 336° the data from Gum's catalogue were used. The restriction that $b < 10°$ was again made. Since the two catalogues do not have the same degree of completeness, a solution giving each nebula unit weight would favor the northern hemisphere. Average values of l and b were therefore formed within each longitude interval of 30° beginning with longitude 336°, and these twelve normal points were given equal weight in the solution.

The two solutions are plotted in Figure 6 along with the 1959 I.A.U. pole determined by Blaauw, Gum, Pawsey, and Westerhout on the basis of 21-cm observations of neutral hydrogen in the inner regions of the galaxy. These observations have established that the portion of the galaxy interior to the sun is characterized by an extremely high degree of flattening. It can be seen from Figure 6 that the solutions obtained here do not differ greatly from each other, whereas they deviate significantly from the 1959 I.A.U. pole as well as from the Lund pole. This is further illustrated in Figure 7, where the normal points of Solution II are plotted in the Lund System along with the galactic equator corresponding to the 1959 I.A.U. pole. The difference in phase of about 40° is well established. These results indicate that the galactic plane defined by the H II regions of Table 1 is tilted with respect to the fundamental plane of the galaxy by about 1°.3 around a line through the sun and directed approximately toward longitude 140°. This agrees with the 21-cm results of Burke (1957) and Westerhout (1957), which show that the outer regions of the galaxy are distorted around a line roughly joining the galactic center and the sun. This tilting of the galactic plane in the neighborhood of the sun can be seen in the relief map of the galaxy given by Westerhout (1957). The pole of the galaxy with respect to optically observed objects thus deviates almost as much from the 1959 I.A.U. pole as from the Lund pole.

The values of p in Table 5 indicate that the sun lies within several parsecs of the galactic plane, although the total weight of the solution is not sufficient to establish on which side.

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