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.	Diameter	Form	Structure	Brightness	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.	Diameter	Form	Structure	Brightness	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.	Diameter	Form	Structure	Brightness	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.	Diameter	Form	Structure	Brightness	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.	Diameter	Form	Structure	Brightness	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.	Diameter	Form	Structure	Brightness	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	6.81	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	Oe5
206	+50° 886		
216	29997	8.9	B8
220	24912	4.05	Oe5
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	Oe5
254	253247	10.0	B2
261	41997	8.5	B
263	34989	5.71	B2
264	36822	4.53	B0
	36861	3.66	Oe5
	36862	5.56	Oe5
	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	Oe5
	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	Oe5
	37041	5.17	B1
	37043	2.87	Oe5
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		Ob
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	Ob
310	57060	4.90	Oe
	57061	4.40	Oe5
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 {5.7	1.2 1.35	Absorption } Interference }	Infrared or 6430 A	303–203	184	YM
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

Str	S	
1		6
2	302	
3	305	
4		6
5		1
6		6
7	298	
8	294	
9	296	
10	296	
11	301	
12	296	
13	296	
14	296	
15	296	
16	297	
17	296	
18	292	
19	296	
20		1
21	273	
22	273	
23	273	
24	273	
25	273	
26	273	
27	280	
28	273	
29	275	
30	252	
31	261	
32		2
33	276	
34	276	
35	264	
36	277	
37	277	
38	281	
39	264	
40	244	
41	264	
42	264	

Y – S

Y	S
1	296
2	276
3	275
4	264
5	236
6	229
7	220
8	199
9	190
10	131
11	117
12	54
13	49
14	25
15	27
16	12

E – S

E	S	
1	2	
2	3	
3	6	
4	10	
5	4	
6	5	
7	8	
8	11	
9	14	
10	13	
11	12	
12	17	
13	16	
14	18	
15	20	
16	19	
17	15	
18	21	
19	22	
20	26	
21	28	
22	30	
23	25	
24	34	
25	46	
26	38	
27	29	
28	42	
29	32	
30	31	
31	40	
32	35	
33	41	
34	43	
35	44	
36		1
37	39	
38		1
39	37	
40	47	
41	54	
42	49	
43	45	
44	48	
45	53	
46	50	
47	57	
48	56	
49	58	
50	55	
51	61	
52	60	
53	59	
54		6
55	69	
56	66	
57	65	
58	76	
59	75	
60	78	
61	74	
62	80	
63	79	
64	83	
65	86	
66	88	
67	87	
68	92	
69	90	
70	89	
71	93	
72	95	
73	97	
74	98	
75	101	
76	105	
77	104	
78	108	
79	109	
80	116	
81	112	
82	115	
83	109	
84	109	
85	109	
86	117	
87	120	
88	121	
89		3
90	124	
91	132	
92	135	
93	138	
94	139	
95	144	
96	142	
97	146	
98	143	
99	154	
100	147	
101	148	
102	149	
103	155	
104	152	
105	153	
106	156	
107	158	
108	159	
109	157	
110	162	
111	163	
112	164	
113	165	
114	166	
115	168	
116	169	
117	170	
118		3
119		6
120	172	
121	173	
122	175	
123		6
124	177	
125		6
126	179	
127	180	
128	181	
129	182	
130	185	
131		6
132	186	
133	187	
134	188	
135	189	
136	190	
137	191	
138	195	
139	197	
140	194	
141	192	
142	193	

YM – S

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

TABLE 4 (Continued)

COMPARISON OF PREVIOUS CATALOGUE DESIGNATIONS
WITH THOSE OF TABLE 1

C	S
1	[1]
2	[5]
3	173
4	175
5	177
6	[1]
7	179
8	184
9	185
10	[5]
11	187
12	188
13	[5]
14	190
15	190
16	190
17	191
18	190
19	197
20	194
21	192
22	193
23	198
24	196
25	199
26	199
27	201
28	[5]
29	202
30	[5]
31	[1]
32	[5]
33	[5]
34	205
35	[5]
36	206
37	220
38	[5]
39	209
40	[6]
41	208
42	207
43	[1]
44	210
45	211
46	212
47	[1]
48	216
49	219
50	217
51	226
52	228
53	229
54	229
55	236
56	263
57	230
58	230
59	230

C	S
60	234
61	230
62	237
63	264
64	264
65	281
66	281
67	279
68	281
69	230
70	[3]
71	233
72	[1]
73	231
74	240
75	230
76	235
77	240
78	232
79	[1]
80	277
81	[1]
82	264
83	242
84	252
85	247
86	261
87	252
88	254
89	256
90	257
91	255
92	269
93	267
94	248
95	248
96	249
97	275
98	280
99	273
100	273
101	282
102	273
103	273
104	275
105	[1]
106	293
107	295
108	296
109	292
110	297
111	296
112	288
113	296
114	296
115	294
116	298
117	310
118	9

C	S
119	8
120	11
121	12
122	[4]
123	22
124	28
125	30
126	25
127	[4]
128	46
129	34
130	29
131	42
132	[4]
133	40
134	35
135	41
136	43
137	44
138	39
139	[1]
140	37
141	54
142	49
143	49
144	45
145	45
146	48
147	53
148	50
149	68
150	56
151	58
152	64
153	61
154	60
155	59
156	69
157	[6]
158	66
159	65
160	[3]
161	71
162	78
163	82
164	[3]
165	[6]
166	86
167	87
168	88
169	92
170	84
171	90
172	89
173	93
174	109
175	101
176	109
177	109

C	S
178	109
179	109
180	109
181	109
182	109
183	109
184	109
185	105
186	109
187	109
188	109
189	109
190	109
191	109
192	109
193	109
194	109
195	104
196	109
197	109
198	109
199	109
200	109
201	109
202	109
203	109
204	109
205	109
206	109
207	109
208	109
209	116
210	109
211	109
212	112
213	109
214	109
215	109
216	109
217	109
218	109
219	109
220	109
221	103
222	103
223	117
224	103
225	109
226	109
227	103
228	103
229	117
230	117
231	103
232	103
233	109
234	117
235	[1]
236	117

C	S
237	109
238	129
239	109
240	119
241	136
242	114
243	118
244	124
245	131
246	125
247	[6]
248	134
249	135
250	140
251	135
252	132
253	135
254	[3]
255	145
256	141
257	126
258	126
259	126
260	139
261	142
262	146
263	143
264	154
265	148
266	155
267	152
268	153
269	151
270	156
271	160
272	158
273	161
274	157
275	159
276	157
277	162
278	163
279	164
280	165
281	168
282	171
283	171
284	170
285	171
286	171

G	S
1	292
2	296
3	297
4	298
5	301
6	302
7	307
8	310
9	311
57	2
58	3
59	5
60	6
61	8
62	8
63	8
64	8
65	9
66	11
67	12
68	13
69	15
70	16
71	22
72	25
73	27
74	28
75	29
76	30
77a	34
77b	35
78	37
79	44
80	46
81	45
82	48
83	49
84	54
85	54

B	S
31500	2
31800	8
32100	11
32300	13
32301	12
32603	15
32701	18
32801	16
33201	22
33402	25, 30
33903	37
34101	44
34201	46
34202	45
34400	49
34401	48
34600	54
35201	60

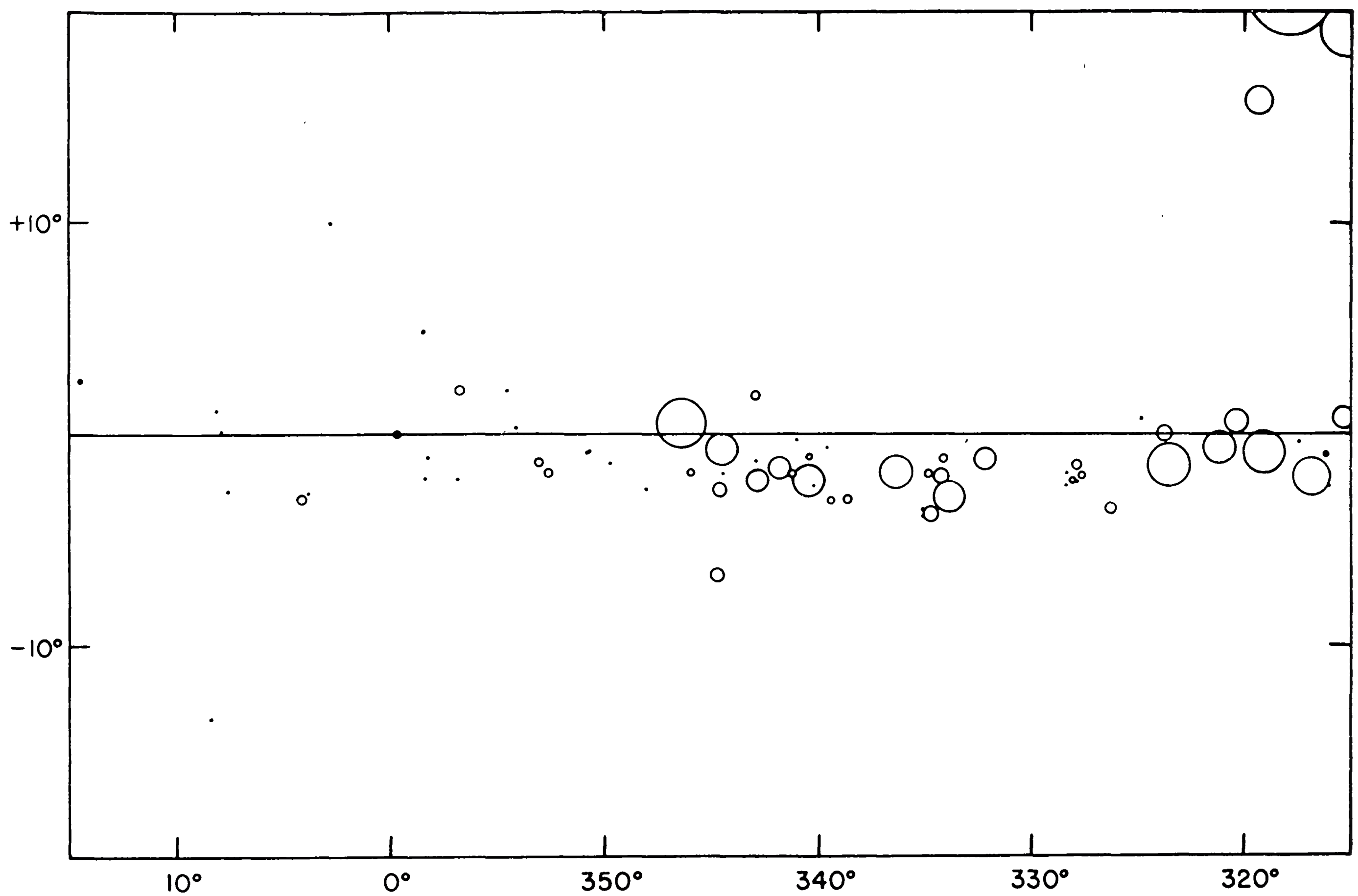

FIG. 1.—The distribution of H II regions between l = 315° and l = 15°

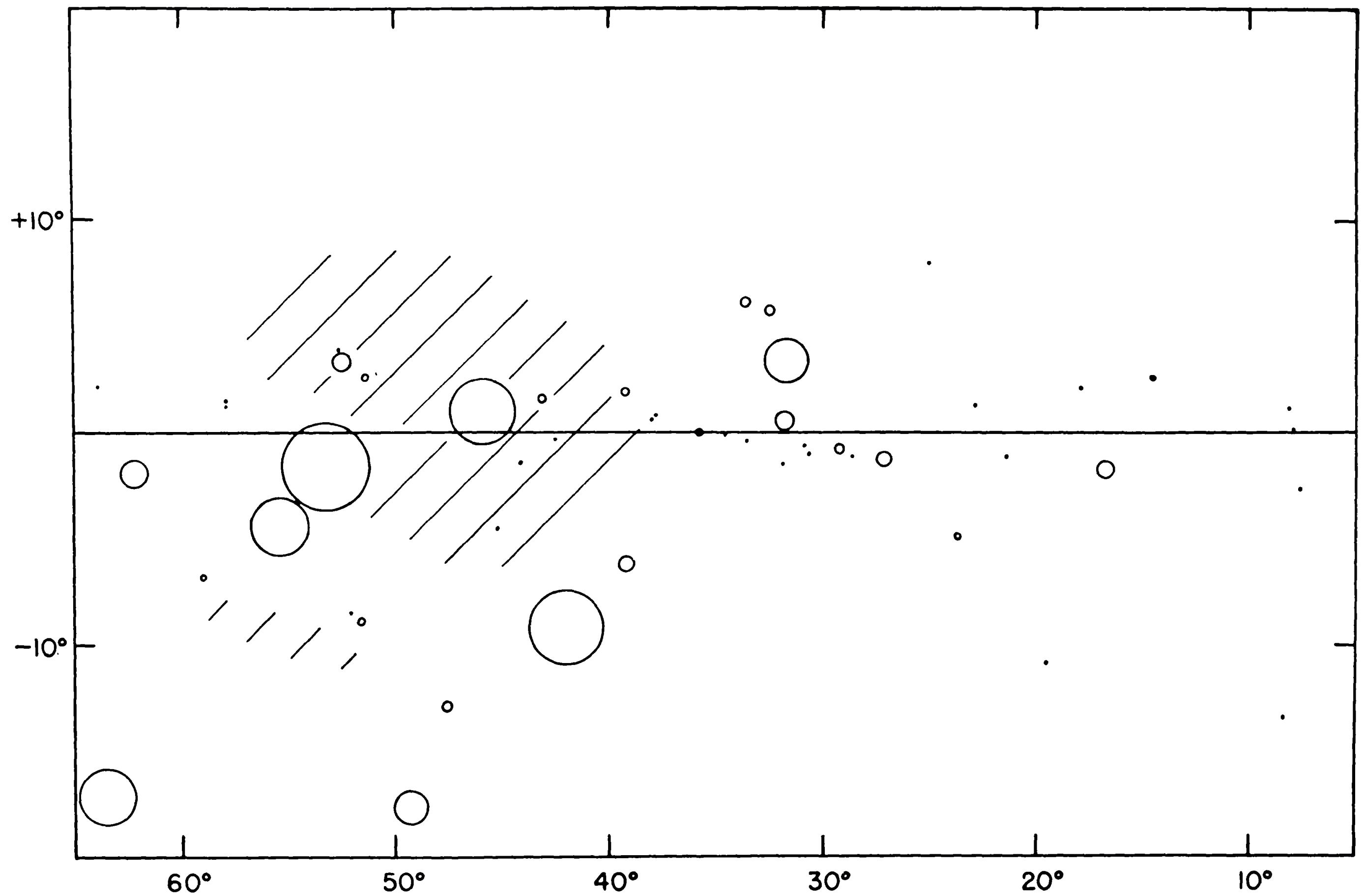

FIG. 2.—The distribution of H II regions between $l = 5°$ and $l = 65°$

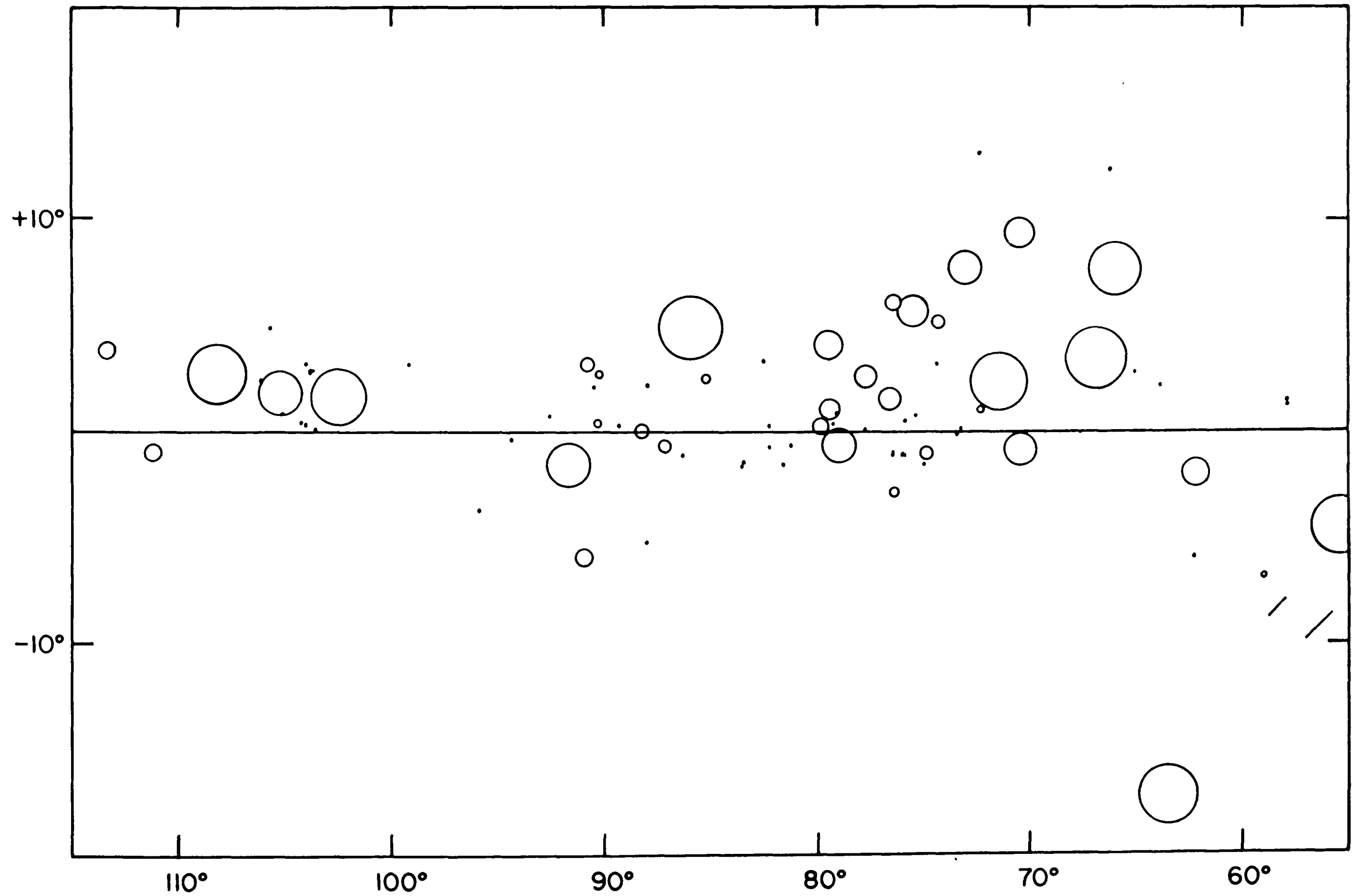

FIG. 3.—The distribution of H II regions between $l = 55°$ and $l = 115°$

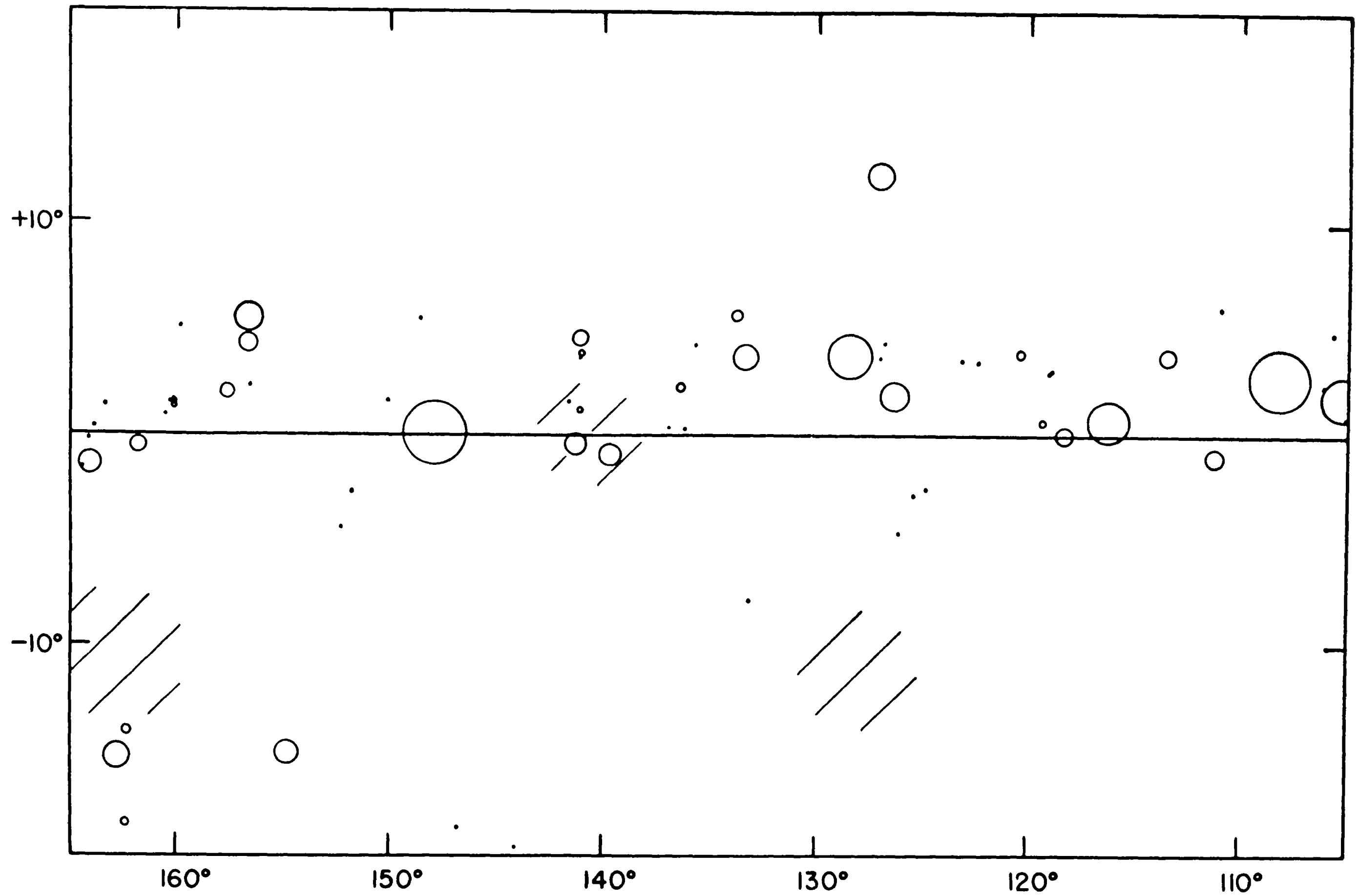

FIG. 4.—The distribution of H II regions between $l = 105°$ and $l = 165°$

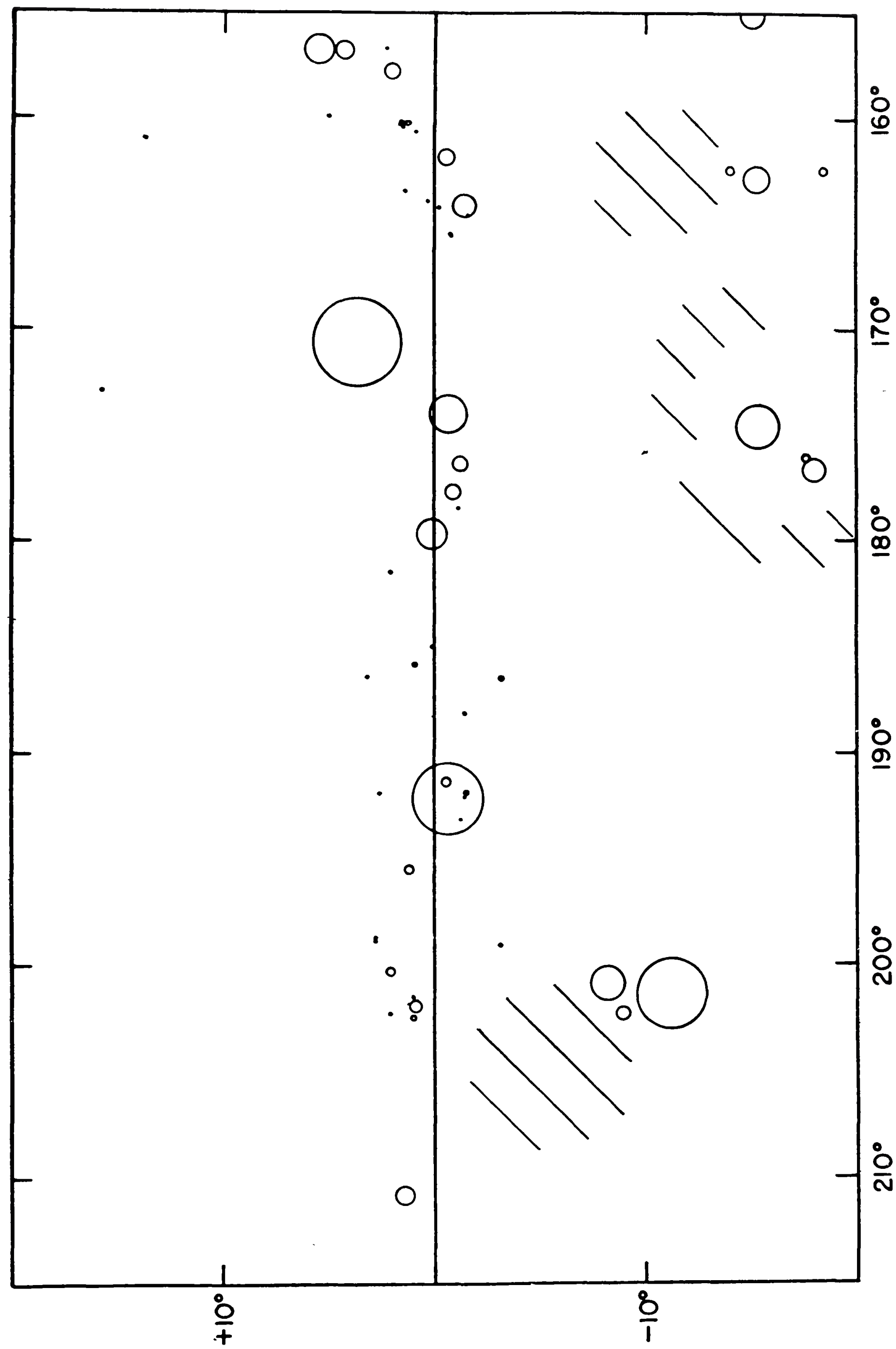

FIG. 5.—The distribution of H II regions between $l = 155°$ and $l = 215°$

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	....

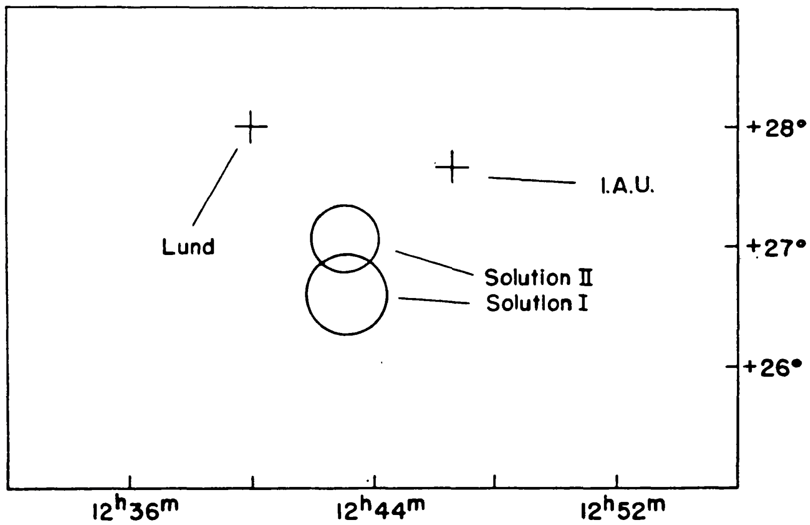

FIG. 6.—Galactic poles plotted in equatorial co-ordinates, epoch 1900

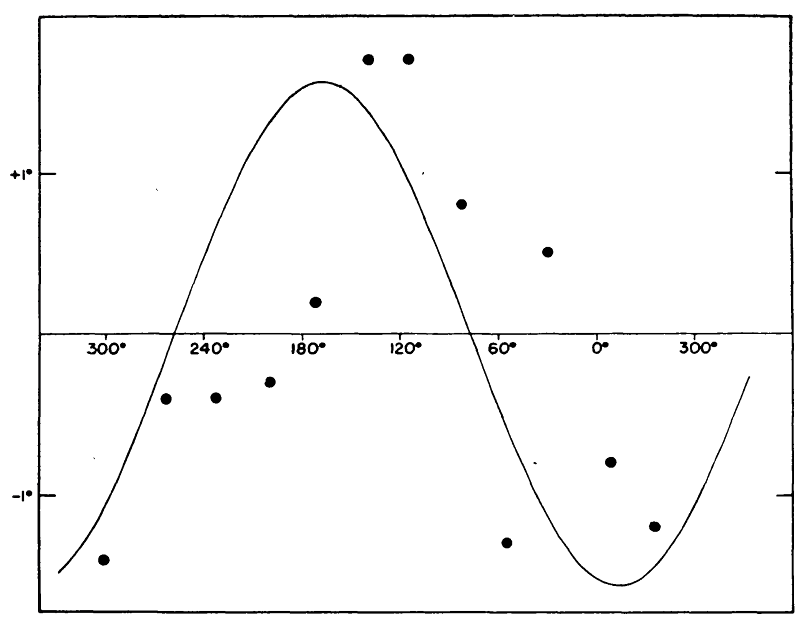

FIG. 7.—The 1959 I.A.U. galactic equator and the normal points of Solution II plotted in the Lund system.

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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