country stretching to the south; or did it accompany the general upon his eventful expeditions and render valuable assistance under the standard of Mars?

Since, however, its distinguished owner was a surveyor in his early manhood, we may safely assume that Venus and Mars, Jupiter and Saturn, in turn peered through the little "sights," and yielded to a trained eye such of their treasures as are compassable by an instrument of its capacity; and that sun spots, mountain ridges and craters on the lunar terminator, and some of the wonders of the galaxy were not unknown to the sturdy patriot who sacrificed so much for his country's liberty.

II. NEW CHARTS FOR INSERTING THE MILKY WAY.

A. PANNEKOEK.

For Popular Astronomy.

Among the existing star charts few are adapted for Milky Way studies. Most of them are on far too small a scale and leave no space for drawing the minutest differences of brightness. Without getting too great dimensions we can use a much larger scale because we need only those parts of the sky, that contain the Milky Way. It is especially necessary that the charts contain all the stars visible to the naked eye; with only the 5th magnitude there are great blank spaces where we have no stars to delineate the streamers and spots, and the greater number of the existing maps, especially those which contain the whole sky in one sheet, do not go farther than the 5th magnitude. It is also a matter of great importance that on the maps we have a name to each star; in order to comprehend the meaning of the picture better, we often need verbal descriptions and it is readily conceived that it is not sufficient to use only the names of the brighter stars. And none of the charts I am acquainted with possess this needful quality.

Those, who are engaged in studying the Milky Way will all have experienced this want. At present it has been remedied by the efforts of Mr. C. Easton, already known among the astronomers by his excellent drawings of the Milky Way.

In Volume 53 of the Monthly Notices, Mr. A. Marth has published an extensive catalogue of galactic longitudes and latitudes of stars in the neighborhood of the Milky Way. These offer an excellent opportunity for drawing a star chart in cylindrical pro-

jection by representing the axis of the Milky Way by a straight line through the middle, the galactic parallells by lines parallel to it and the galactic latitude circles by perpendiculars on it. Such charts I had constructed for my private use, directly after the publication of the catalogue. Mr. Easton afterwards lithographed them and they can now be had by any one studying this subject at very slight expense. I will now proceed to describe these charts and the method of using them.

The northern Milky Way region is contained in two charts, each extending 90° in galactic longitude and 50° in galactic latitude (25° on each side of the axis). The first extends from 0° (the intersection with the equator in Aquila) to 90° (the point nearest to the north pole in Cassiopeia), and the other from 90° to 180° longitude (intersection with the equator in Monoceros). The degrees of longitude are everywhere 1° = 5 min; the degrees of latitude grow smaller with increasing latitude in the ratio of cos. latitude. This is done so that equal parts of the sky in different latitudes may be represented by equal parts of the chart.

In order to prevent confusion only the black points of different size, representing the stars, are drawn on the charts; but the means are given to add, when desired, the lines of equal longitude and latitude which are straight lines in this projection and the names of the stars. The four edges are divided into degrees by short strokes, so that it is easy to draw the straight lines through the chart. On both sides of the chart a margin is added, measuring the fourth part of the breadth of the chart itself; this margin contains the names exactly on the spot where the stars would be placed if the scale of longitudes was the same, and the scale of latitude were reduced to half; the name of each star on the chart is very easy to find on the margin. As each observer uses more than one chart, I should advise filling up one of the charts with the names and the latitude circles and parallels, and to use this chart always as an example for reference.

For the names of the stars I have used firstly, the Greek letters of Bayer and the numbers of Flamsteed. But these are not sufficient. For stars not contained in Flamsteed's catalogue I have made use of the numbers in Baily's British Association Catalogue, which are usually designated by the prefix *B A C* but which in this case, in order to gain space, are placed in parentheses. Some stars of the 6th magnitude remain, that do not occur in the *B A C*. For these I have used the number in the catalogue of Weis (Atlas coelestis novus) with *H* prefixed. The magnitudes of the stars are taken by Marth from the General Catalogue of Pickering.

It should be observed however that the magnitude of the black circles is not always exactly concordant with the visual magnitude, because they are drawn by eye estimate. A few small stars remain that have no names at all. As this might give confusion and uncertainty on filling up the charts with names I have added a list of these anonymous stars, indicated by their galactic longitude and latitued.

°	°	°	°	°	°
9.5	− 18.1*	92.1	+ 1.0	141.7	− 7.7
34.7	+ 10.1	104.0	+ 15.2†	144.2	− 1.9
37.0	+ 0.7	104.8	+ 4.6	145.2	− 14.9
42.9	+ 9.3	106.0	+ 8.9	156.2	− 1.3‖
53.1	+ 0.2	108.3	+ 8.9	156.7	+ 24.3
55.6	+ 20.2	111.7	− 8.1	166.0	− 4.3
61.2	+ 0.2	114.8	− 3.8‡	169.6	− 17.8§
62.2	+ 6.7	118.3	− 6.5	174.0	− 8.8
62.2	+ 8.3	124.8	+ 14.3	176.0	− 8.3
91.3	− 0.3	126.3	+ 21.5	176.6	− 18.6¶
		133.6	− 19.5		

* Between δ and 62 Aquilae. † smaller of two stars. ‡ between (1035) and (1059) ‖ at the right side of χ Orionis. § at the left side of 22 Orionis, ¶ in contact with ι Orionis.

Some errors are found on the charts, for which reason I have appended the following list of corrections

I. Wrong Names of the Stars.

(In the first column the approximate longitude is given, while + or − indicates the sign of the latitude).

°					°				
9	− Aquila	7	should be	η	77	+ Cassiop.	e	should be	1
19	+ Herculis	40	"	100	93	+ Cepheus	(608)	"	(605)
24	+ "	103	"	108	122	− Perseus	$H26$	"	$H86$
27	+ Lvra	7616	"	$H26$	123	+ Camelop.	$H57$	should be	two names 7 (for left, brighter star) and $H55$ (for right, fainter star).
30	− Vulpecula	7640	"	$H40$					
33	− "	7650	"	$H50$					
41	+ Cygnus	(6847)	"	(6817)	141	− Taurus	57	should be	51
44	+ "	$H23$	"	$H123$	142	− "	92	"	72
58	+ "	(7405)	"	(7105)	147	− "	y	"	h
59	+ "	(6853)	"	(6852)	148	− "	155	"	105
63	− Lacerta	(7618)	"	$H18$	149	− "	g	"	C
63	− "	p	"	(7705)	163	− Orion	$H16$	"	$H18$
64	− "	i	"	$H6$	163	− "	$H112$	"	$H102$
66	− Cygnus	(7476)	"	(7676)	164	− "	(1857)	"	(1851)
72	− Lacerta	($H30$)	"	$H30$	167	− "	32	"	52
72	+ Cepheus	(9658)	"	(7658)	168	− "	$H63$	"	$H53$
74	+ "	(1766)	"	(7766)	172	− Monoc.	$H1$	"	$H7$
76	+ "	(7943)	"	(7973)	154	− Orion	H	"	omitted

II. Names, that can be Misunderstood by their Resembling other Names.

°				°			
11	− Aquila σ	(resembles	5)	106	− Androm. C	(resembles	k)
30	− Vulpecula $H23$	("	$H28$)	112	− Perseus Wiess 34	("	54)
31	+ Cygnus 9	("	ρ)	114	− " k	("	10)
51	− Pegasus ι	("	i)	114	+ Camelop. (1751)		
64	− Lacerta 7628	("	$H23$)	139	+ Auriga $H23$		
97	− Androm. (425)			154	+ Gemini 28		
105	+ Camelop. (1510)			159	+ " σ	("	6 or 5)

III. Stars that are Omitted, while their Names are on the Margin.

(The first columns give their galactic longitude and latitude).

°	°			
14.3	+ 2.6	Aquila ζ	3d	magn. (as γ Aquila)
28.3	+ 14 6	Lyra *H*26	6th	" (as the smallest on the chart).
44.6	+ 12.0	Cygnus (6731)	5th	" (as the small star near δ Cygni).
44 9	+ 21.3	Draco (6428)	6th	"
75.0	− 15.6	Androm. 13	5½	"
100.3	− 22.4	Androm.(465)	6th	"
178.9	− 12.5	Canis Minor η	5th	" (as 1 and 11 Can. min).

IV. False Stars, to be Omitted.

°	°	
1.8	+ 7.9	Ophiuchi.
90.8	− 14.7	Andromeda.
126.5	− 13.0	Perseus.

V. Stars whose Names are Omitted.

°	°		°	°	
16 2	− 4.5	Aquila is ψ	91.2	+ 5.8	Cassiop. is (261)
62.0	− 7.2	Lacerta " (7681)	126.5	− 14.2	Perseus " 40
62.8	− 9.8	" " (7770)	162.9	− 22.9	Orion " 5

VI. Remarks on Boundary Lines.

140° Boundary line around *H*132 and (2261) should be omitted. Both stars belong to Auriga.

°		
170	− 17°.5	The constellation with star β is not Lepus, but Eridanus.
89.8	− 15 .8	*H*38 belongs to Andromeda.
56	+ 24	Name *O*, after the word Draco, should be placed somewhat lower.

The charts may be had free of expense by applying for them to the editor of this journal.

ASTRONOMICAL PHENOMENA DURING 1898.

H. C. WILSON.

Eclipses.

In 1898 there will be six eclipses, three of the Sun and two of the Moon.

1.—*A Partial Eclipse of the Moon, Jan. 7* will be visible generally in the eastern parts of North America, in South America, Europe, Asia, and Africa.

The southern portion of the Moon will dip into the shadow of the Earth as it passes, about one-seventh of its disk being covered at the maximum of the eclipse. The elements of this eclipse as given in the *American Ephemeris* for 1898 are as follows:

Greenwich Mean Time of conjunction in right ascension January 7, $12^h\ 9^m\ 48^s.7$

Sun's right ascension	19^h	17^m	$7^s.24$	Hourly motion	$10^s.91$
Moon's right ascension	7	17	7 .24	Hourly motion	128 37
Sun's declination	22°	16′	11″.5 S.	Hourly motion	0′ 20″.1 N.
Moon's declination	23	6	51 .0 N.	Hourly motion	6 41 .4 S.
Sun's equa. hor. parallax			8 .9	Sun's true semidiam.	16′ 16″.0
Moon's equa. hor. parallax		54	33 .0	Moon's " "	14 51 .1