SPRING SKIES 1983

STANLEY J. SHADICK, Dept. of Physics, University of Saskatchewan, Saskatoon, Saskatchewan. S7N 0W0

This spring will be an excellent time for viewing the planets. The five naked eye planets (Mercury, Venus, Mars, Jupiter and Saturn) will all make appearances during this period. As a special bonus, Uranus will pass very close to Jupiter in mid-May and can therefore be located quite easily with binoculars. A guide to use when looking for these planets is given below. The charts and times have been calculated for an observer near Saskatoon but should apply with very small error to anywhere in southern Saskatchewan.

Venus

Visible: March to early July. Except for the Moon, Venus is the brightest object in the evening sky. It will be easily seen in the western sky for about 2 hours following sunset. As Venus orbits the sun, it goes through phases similar to the Moon. In July, a spotting scope or rigidly held binoculars should reveal the crescent phase.

Mars

Visible: early March. Throughout 1983 Mars will be on the far side of the sun and hence will be relatively faint and small in size. It can be spotted in early March if you have an unobstructed view of the western horizon. Look for it about 1 hour after sunset as it will set shortly thereafter. It will be located about 9° below and 5° to the right of Venus. (For reference purposes, a closed fist at arm's length covers an angle of about 10°). With binoculars, Mars should appear as a small reddish dot (Figure 5).

Mercury

Visible: late April. Being the innermost of the nine planets, Mercury is usually too close to the sun to be easily observed. A rare chance to spot this planet occurs during the last half of April. You should have an unobstructed view of the WNW horizon and look for it 45-60 minutes after sunset. Figure 1 indicates the position of Mercury 1 hour after sunset on April 22. Be careful not to confuse Mercury with Venus which is much brighter and is located about 20° to the upper left of Mercury.

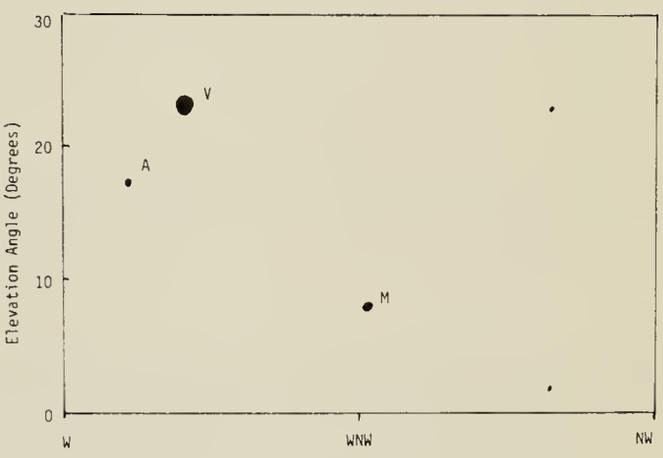


Figure 1. *WNW Sky at 9:15 p.m. 22 April. Letters indicate positions of Venus (V), Mercury (M) and the red giant star Aldebaran (A).*

Saturn

Visible: March to September. In mid March Saturn rises about 10:30 p.m. By mid April it rises about 2 hours earlier and will be easily seen in the late evening sky. Figure 2 shows the position of Saturn above the southeastern horizon at midnight on 15 March or at 10:00 p.m. on 15 April. Do not confuse Saturn with Spica, the bright first magnitude star which rises one-half hour earlier.

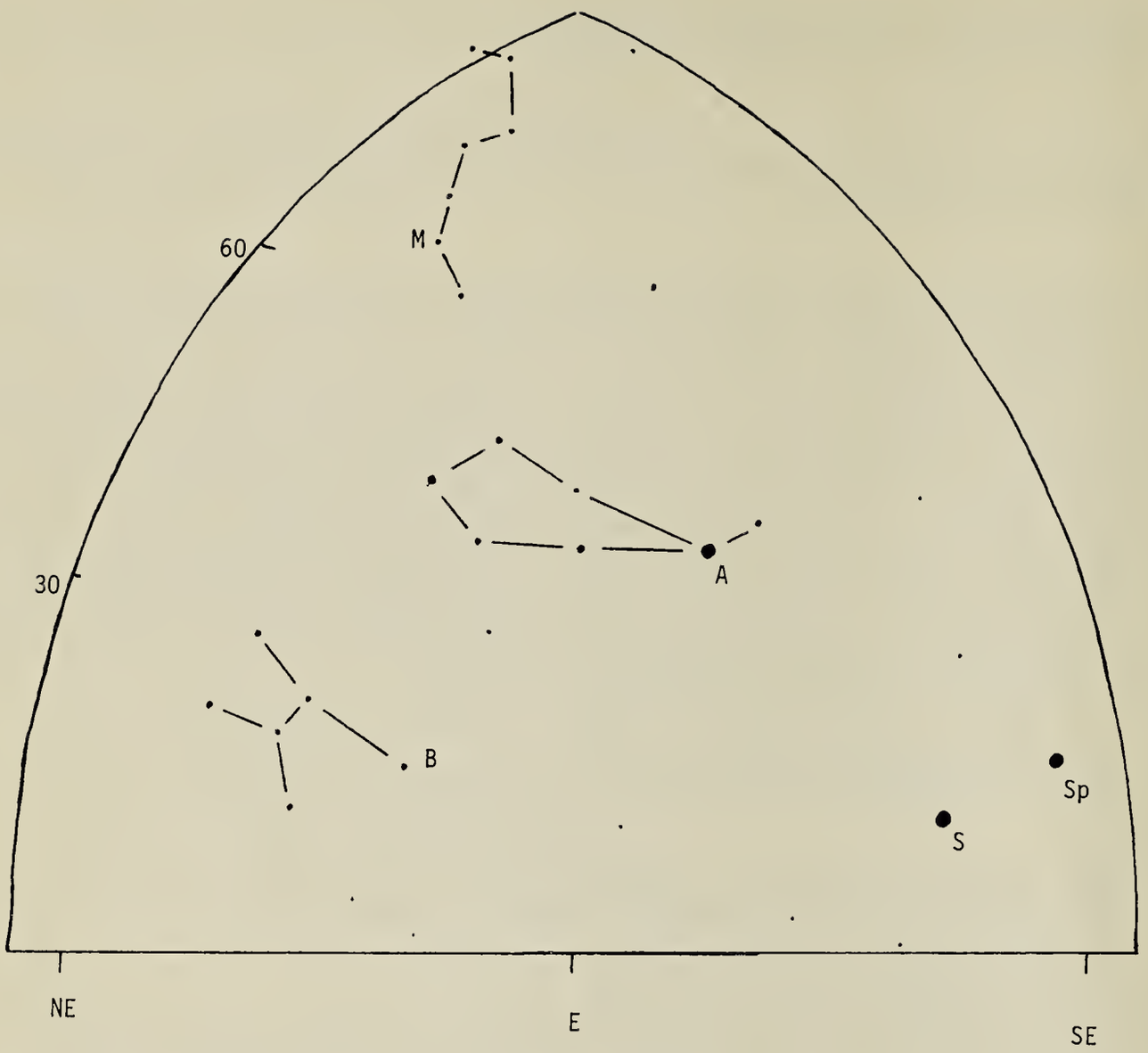
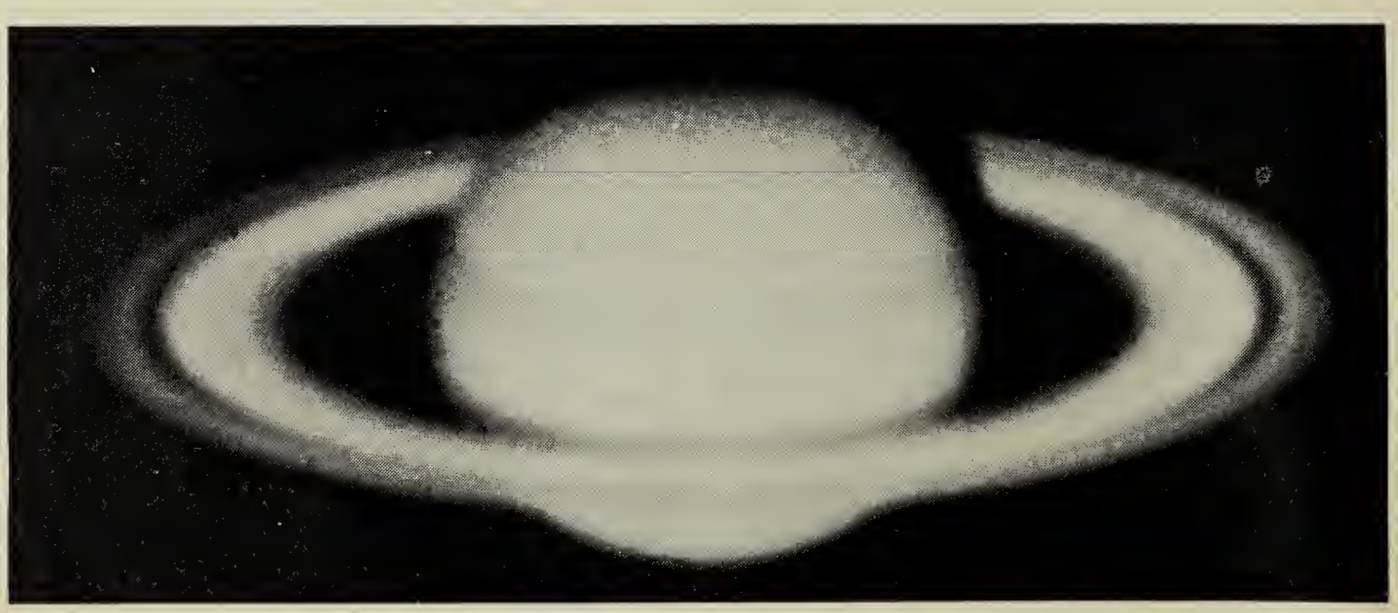


Figure 2. *Eastern Sky at 12 p.m. 15 March or 11 p.m. 1 April or 10 p.m. 15 April. Letters indicate positions of Saturn (S) and the stars: Spica (Sp) in Virgo constellation; Beta Hercules (B) in Hercules; Arcturus (A) in Bootes; and the binary Mizar (M) in Ursa Major. The zenith is at the top of the diagram. Elevation angles are given at the side.*



Planet Saturn, sixth from the sun. *Hale Observatories*

A spotting scope (and some binoculars) will show the spectacular rings surrounding the spherical planet. The Voyager spacecraft determined that the rings are composed of thousands of particles of dust or ice, each of which orbits Saturn in the same plane.

A scope should also reveal Titan, the largest of Saturn's 15 moons. It appears as a faint dot at up to 5 ring diameters separation from Saturn. As Titan revolves around Saturn once every 16 days, its position will change slightly from night to night. Occasionally it will be hidden behind Saturn itself. Under ideal conditions a small telescope may reveal Rhea, a fainter tenth magnitude moon at a separation of less than 2 ring diameters from Saturn.

Jupiter

Visible: March to October. Because of its gigantic size, Jupiter is brighter than all other planets except Venus. During March and April Jupiter can be seen low in the southwest before sunrise. In mid May it rises about 10:00 p.m. and will be visible in the late evening sky. Figure 3 shows the location of Jupiter at midnight on 15 May (or at other times and dates listed). Even

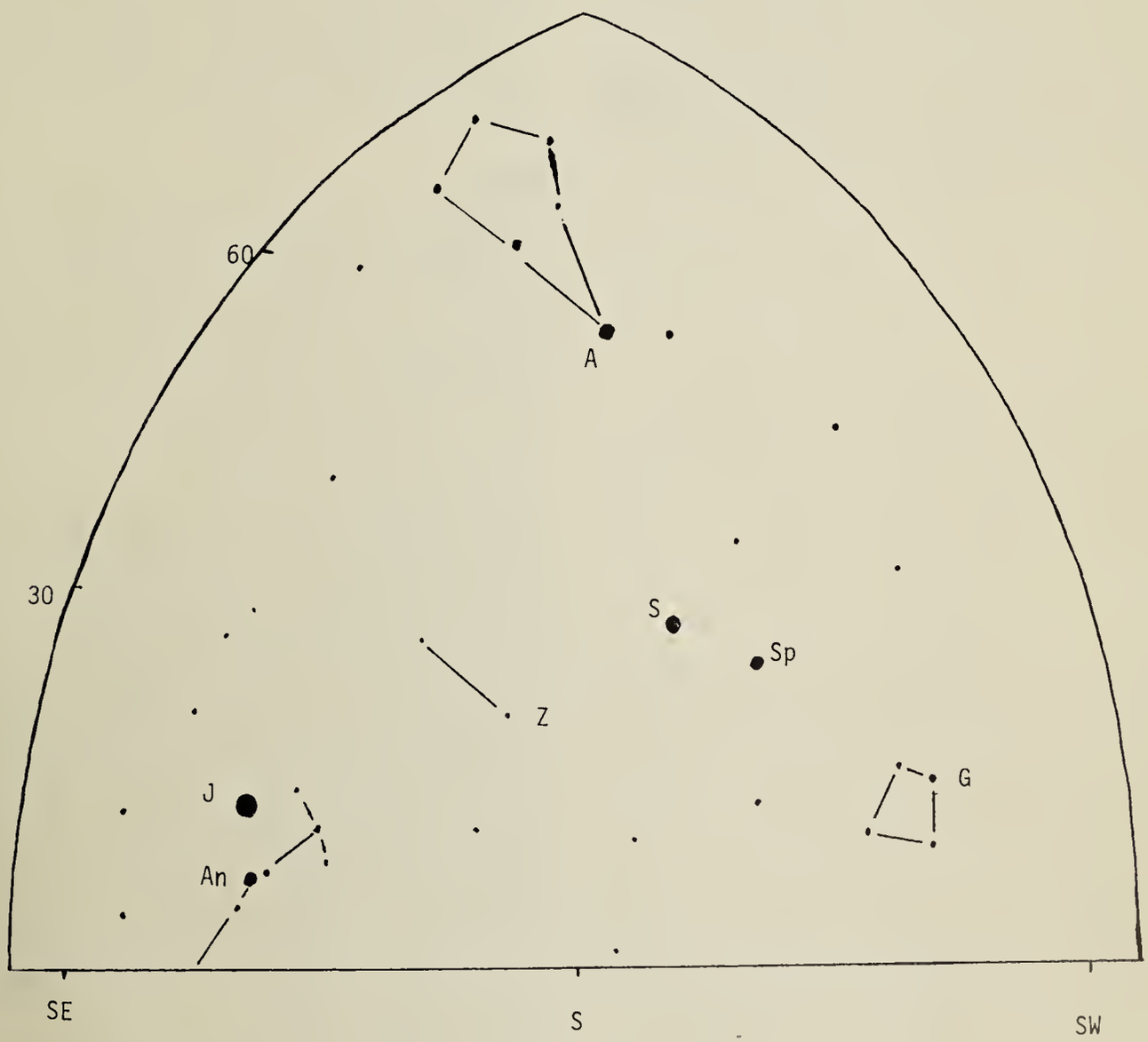


Figure 3. *Southern Sky at 4 a.m. 15 March* or *2 a.m. 15 April* or *12 p.m. 15 May* or *10 p.m. 15 June. Letters indicate positions of Jupiter (J), Saturn (S) and the stars: Arcturus (A) in Bootes constellation; Spica (Sp) in Virgo; Gienah (G) in Corvus (the Crow); Zubenelgenubi (Z) in Libra; and Antares (An) in Scorpius.*

though it had risen two hours earlier, it is still only 13° above the SSE horizon. Be careful not to confuse Jupiter with Saturn which rises about 4 hours earlier.

Once you have found Jupiter, look at it with a rigidly held pair of binoculars or a spotting scope. You can then make out the spherical shape of the planet. In addition you should be able to see some of the four moons of Jupiter which were discovered by Galileo. Their names are Io, Europa, Ganymede and Callisto. They should all appear in a straight line on either side of Jupiter. If you observe these moons on successive evenings, you should notice that their position changes as they orbit Jupiter. This effect is especially noticeable for Io, the innermost of the 4 moons, which completes one orbit of Jupiter in 42.5 hours. Occasionally one or two of the moons will not be visible if they are hidden on the far side of Jupiter or if they are directly between Earth and Jupiter.

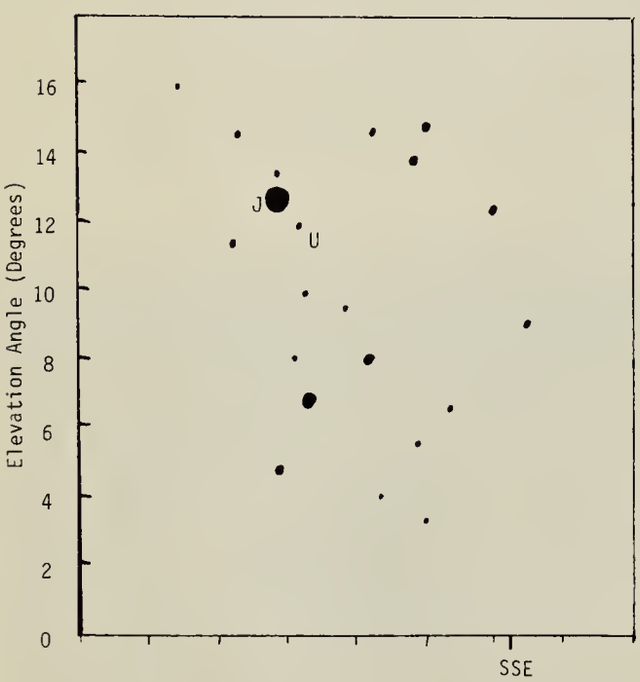


Figure 4. *Enlarged Binocular View of Jupiter region from Figure 3. Letters indicate positions of Jupiter (J) and Uranus (U).*

Uranus

Visible: March to October; best date: 15 May. Although Uranus can be easily seen with a pair of binoculars, few people have ever done so. The problem is that Uranus is a relatively faint fifth magnitude planet and must be distinguished from the hundreds of stars with similar brightness. This year it should be fairly easy to locate as it passes within a few degrees of the very bright planet, Jupiter. Figure 4 shows the position of Uranus as seen with binoculars at midnight on 15 May. On this date it is only 0.9° to the lower right of Jupiter. Be careful; Uranus will be of similar brightness to Jupiter's moons but its separation from Jupiter will still be at least 10 times that of Callisto, Jupiter's outermost moon. A good spotting scope at high magnification should reveal Uranus to be a very small greenish disk, 1/12 the size of Jupiter.

Stars

Sirius, the brightest of all the stars in the night sky is shown in Figure 5. The reason for its dazzling brilliance is that it is very near, only 8.7 light years (1 light year equals 9.5 trillion km). In fact it is the nearest star visible from Canada without using a telescope.

Other stars appear relatively bright, not because they are nearby, but because they radiate much more light than average stars. Most of these stars are old stars which have expanded so much in size that their radius approaches the distance from the Earth to the Sun (150 million km). As they expand, their colour reddens, so astronomers classify them as red giants. Stars of this class which have been identified in the figures include Aldebaran and Arcturus. With binoculars you should be able to detect their reddish colour.

Stars, which are much more massive than the Sun, will expand in old age to an even greater size than giants. Such rare stars are classified as supergiants and can be seen easily from very great

distances. Rigel in Orion is an example of a blue supergiant at a distance of 900 light years. The stars, Antares and Betelgeuse are examples of very red supergiants.

The Pleiades is a cluster of stars easily seen by the naked eye. They appear to be in the shape of a tiny dipper and some people mistake them for the Little Dipper constellation (Ursa Minor). The Pleiades are believed to be very young stars, each of which has condensed out of the same gas cloud.

Almost all of the objects which have been described above are visible with the naked eye or with binoculars. Of course an improved view can be obtained with a telescope. Visitors to Saskatoon (and residents!) are welcome to visit the observatory on the university campus any clear Wednesday evening, throughout the year — no appointment necessary.

[1]BISHOP, ROY. Editor, Observer's Handbook 1983, Royal Astronomical Society of Canada, 124 Merton St., Toronto.

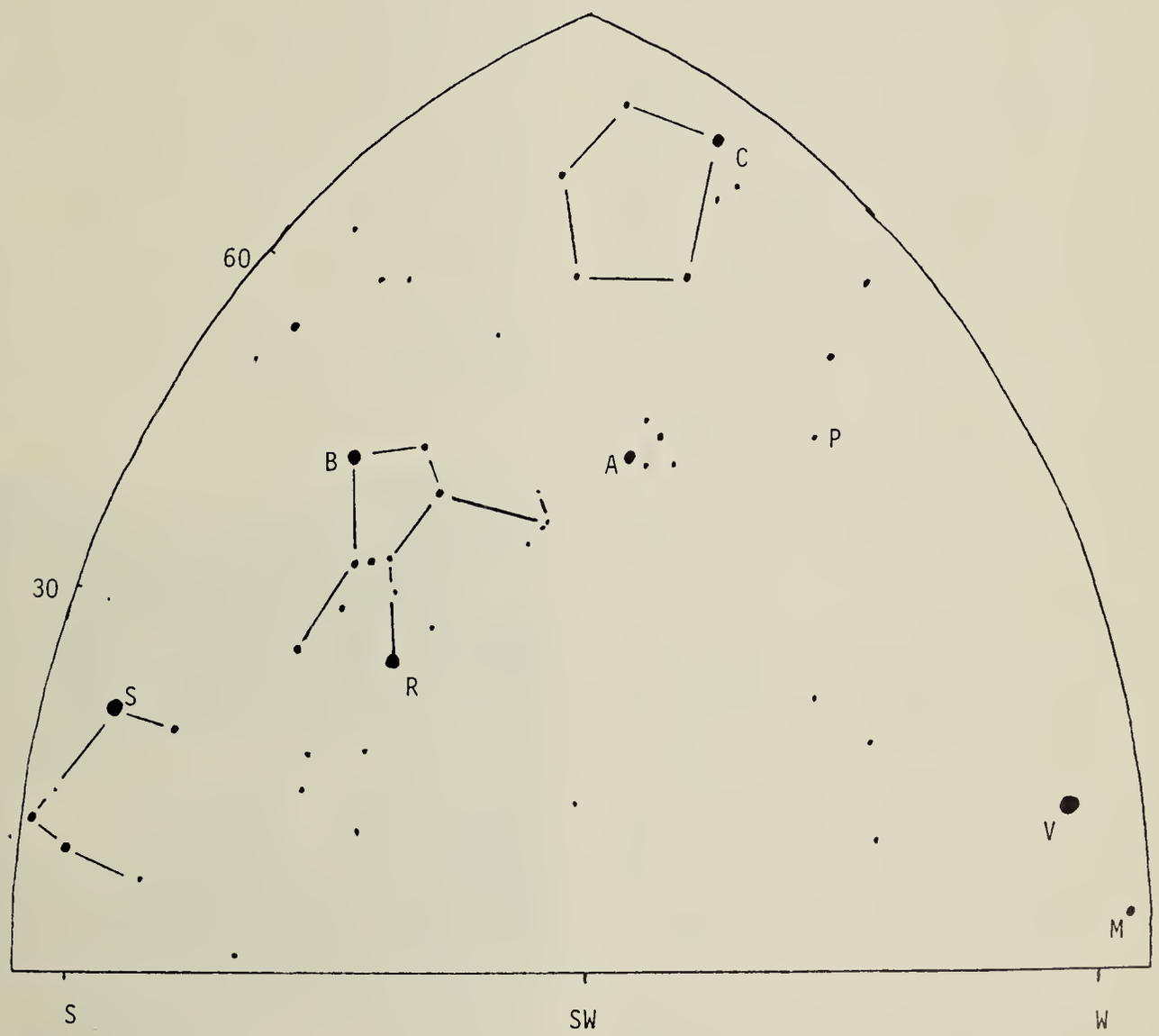


Figure 5. *SW Sky at 8:30 p.m. 15 March. Letters indicate positions of Venus (V), Mars (M) and the stars: Capella (C) in Auriga constellation; Betelgeuse (B) and Rigel (R) in Orion; Aldebaran (A) in Taurus; and Sirius (S) in Canis Major. The Pleiades cluster is shown by "P".*