

way from two seconds to two hours. At Yarmouth the maximum is three and a half minutes and the minimum three. At Dalhousie these are four and three and a quarter minutes. At the poles it takes the sun thirty-three hours to rise and as long to set, but he can afford it there as he rises and sets only once a year. On the equator and at the equinoxes the time is least of all, being a little over two minutes.

We were at our greatest distance from the sun — or, as the almanacs say, the sun was in apogee — or, if you are a bigoted Copernicist, the earth was in aphelion — this year on July 1st. (See notes in July REVIEW.) We have been drawing nearer to the sun ever since, but there will be no perihelion for us this year. Never mind, next year we'll have two. The first of them will happen at 3 a. m. on January 2nd. We shall then be more than three millions of miles nearer the sun than we were on July 1st. There are people who find it hard to believe that we can be so much nearer the sun in midwinter than in midsummer. If this is your case, get a sextant and measure the sun's diameter at the beginning of January. Then wait until the 1st of July and measure it again. If you do it well, you will find that the January diameter is larger than the July one by nearly three and a half per cent. This should help your unbelief, unless you prefer to suppose that the sun swells up in winter and contracts again in summer.

The interval from one perihelion to the next is what astronomers call the anomalistic year. Its mean length is twenty-five minutes more than the tropical year, (the one generally used by mankind), but its actual length is variable. From the last perihelion to the one on January 2nd the interval is 366 days 15 hours; and from that one to the one on December 31, 1890, the interval will be 363 days 12 hours. At the coming one the earth will be 3000 miles nearer the sun than at the one in December last, and 1000 miles nearer than at the one in December next.

*Mercury* will be evening star from December 7 to January 29, at his best in January, especially from about the tenth to about the twentieth.

*Venus* is still morning star and will be so until February 18. Morning star-gazers may amuse themselves trying how near to that date they can see her, and then they will know how soon after that they may expect to see her in the evening.

*Mars* is brightening up for his opposition next year. He won't be visible before midnight until the end of March.

*Jupiter* is still visible for a little while after sunset, but the sun is gaining on him fast. They will be in

conjunction on January 10, and after that our evening sky will know Jupiter no more for about five months.

*Saturn* is getting ready to fill Jupiter's place as evening star. In the middle of December he will rise about 10 p. m. (mean time), and about nine at the end of the month. He is now between five and six degrees east and south of Regulus, and is creeping very slowly eastward. He will stop that on December 15, when he will be less than two degrees north and a little west of Rho Leonis, a fourth magnitude star. Then he will move west again, back towards Regulus. If you have a glass that just showed his ring last spring you may find that it won't do it this winter. If so, don't break your glass, it is the ring that is to blame.

*Uranus* may be seen on the morning of December 24th about one degree south of Mars, both planets being near Spica.

*Neptune* became an evening star on November 25th. He was visible in the east before midnight a couple of months before that, but a planet is not considered an "evening star" until it is on the meridian before true midnight. In Neptune's case it is almost an abuse of language to call it an evening star at any time, for, as it is only about as bright as a ninth magnitude star, it can't be seen by the naked eye. But a field glass will show it, and an opera glass may, if it is a good one. If you would like to be able to say that you have seen Neptune, try the following prescription: First find Omega Tauri. Taurus has two Omegas, about two degrees apart. They lie about half way between Aldebaran and the Pleiads. The east one is of magnitude five and a half, the west one six. It is the west one you want. Point your glass at it and look for a small star close to it on the north-west side. If you can't see it, then your glass, your eye or the night is not good enough to see Neptune. If you can, then find Neptune from what follows: Previous to December 21 he will be south and a little east of Omega. On December 21 he will be directly south of it and about as far from it as the distance between Aleyone and Merope (the brightest Pleiad and the one nearest it). He will move west until February 10th, and will then be about three quarters of a degree west and south of Omega. On April 1st he will be back under Omega again and nearer it than on December 21st. During these three months and more he will wander among the stars about as far as Jupiter does in five days at present, and as far as the moon usually does in about two hours and a half. A year from next February your glass will still show Neptune and Omega at the same time.

C.