

SCIENTIFIC NOTES.

The chief astronomical event to occur in November is the transit of the Sun's disc, on the 10th, by the planet Mercury. So far as the Earth is concerned, the only planets which can cross the solar line of sight are Venus and Mercury. The transits of Venus, which are comparatively rare, and occur in pairs at regular intervals, possess a scientific value of a high order. The transits of Mercury occur much more often and at irregular intervals, and possess little value, though they are carefully observed at every astronomical station from which they are visible. There have been already thirteen transits during the century, but the one on the 10th will be more interesting, in some respects, than most of those which have preceded it. This will be largely due to the fact that, instead of crossing a small portion of the solar face, as sometimes happens, Mercury will transit very near to the solar centre, so that the planet will be on the Sun nearly five hours; and to the further fact that, weather permitting, the whole of the phenomenon will be visible from all parts of the American continent. At the time of the transit, the diameter of the Sun will be nearly thirty-two and one-half minutes of arc, while that of Mercury will be nearly ten seconds of arc, or 190th that of the Sun, so that the planet must be looked for with a telescope of some power, though, if the conditions be extremely favorable, it may be visible as a minute round black spot even in ordinary spy-glasses. Every one who can should try at least to catch a glimpse of the planet, as the coming transit is the last that can occur before November, 12th, 1907. The times of contact have been especially calculated for Toronto by Mr. Thomas Lindsay of The Astronomical and Physical Society, as follows: first external contact, 10.55'43" a.m.; first internal contact, 10.57'22" a.m.; last internal contact, 4 11'50" p.m.; last external contact, 4 13'29" p.m. Those who have the instrumental means of determining the positions, should point their telescopes at that portion of the solar limb which is 98 degrees from the North point to-

wards the East, or 116 degrees from the vertex towards the left for the direct image. However, as astronomical eye-pieces will, in most instances, be used, and as these invert the image, it may be added that observers should keep their eyes directed to a small arc about 20 degrees below the centre of the upper right-hand quadrant of the solar limb. Mr. Lindsay's calculations are based upon the elements found in the British Nautical Almanac, which gives results nearly thirty-seven seconds later than those predicted in the American Nautical Almanac. Observers should have their time-pieces correct to the second, if possible, and should take the instant something is seen to touch the sharp edge of the Sun. We say "something" because the planet itself will not be visible until it begins to encroach on the solar limb. The time of external contact means the instant the edge of the planet shows on that of the Sun; the time of internal contact means the instant the whole of the planet is within the edge of the Sun. It is important that these instants should be noted with absolute accuracy. *Popular Astronomy* suggests that astronomers should "watch carefully to see if, as it enters upon and leaves the disc of the Sun, the planet is encircled by a ring of light, and if, when fully on the disc, it is surrounded by a narrow dusky fringe. These, if seen, would be evidence of an extensive atmosphere upon the planet." Also, "The best way for most to observe it (the transit) will probably be by projecting the sun's image on a white screen. Such a screen may be made of white card-board and fastened a foot or more back of the eye-piece by means of a wire-frame. By proper focusing, a very sharp image of the Sun, from six inches to a foot in diameter, may be obtained even with a very small telescope or spy-glass."

During November, Mars and Jupiter will be the most interesting planetary objects. Both already afford opportunities for many hours of profitable study. G.E.L.

