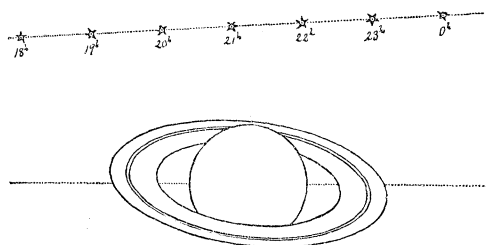


mended no eggs have gone down, we have concluded that it is natural for cod-eggs to float, and that under no other conditions will normal development be accomplished. JOHN A. RYDER.

Wood's Holl, Dec. 21.

### CLOSE APPROACH OF SATURN AND GEMINORUM.

ON the night of 1886 Jan. 9 (or morning of the 10th, civil time) there will occur a very close approach of the planet Saturn to the star  $\mu$  Geminorum, whose magnitude is given as 3.22 in the Harvard photometry. The figure below gives the relative configurations of planet and star for successive hours of Greenwich mean time (astronomical) as seen in the ordinary inverting telescope.



To see it as it will appear to the naked eye, with an opera or field glass, or with a telescope having a terrestrial eyepiece, turn the diagram bottom upwards. At the time of nearest approach to the centre of the ball (a little after 21<sup>h</sup>) the star will be about 26" from the centre, or 16" from the edge of the ball. For convenience the planet is figured as stationary, and the star as moving by it. Of course, the planet (as seen in the telescope) moves to the left, parallel to the line through the successive positions of the star. The dotted line through the planet's centre is parallel to the earth's equator, and makes an angle of 6° 35' with the major axis of the rings. The time of nearest approach is about five hours after the transit over the meridian of Washington, and is well visible over the whole of this country, though of course best for the Pacific slope, where it will not be so far down in the west. To convert the times given above into the standard civil times, add 7<sup>h</sup>, 6<sup>h</sup>, 5<sup>h</sup>, and 4<sup>h</sup> respectively, subtracting 24<sup>h</sup> if necessary, which carries it into the civil day of Jan. 10.

Astronomically the event is of very little importance compared with what an actual occultation by the ring, or by the ring and ball, would be. A star as bright as this, and behind the rings, would offer a test we have never had yet of their possible transparency through interstices in the probable cloud of satellites. The action of the dusky ring

(not indicated above) would be especially interesting. A central occultation by the ball would give, by means of micrometric measures and the duration of the occultation, a sharp test of the refracting power of Saturn's atmosphere, and the possible semi-transparency of its upper cloud-surface. So near an approach of Saturn to a star as bright as the 3.22 magnitude is an exceedingly rare event. Assuming that the distribution of stars brighter than the 3.22 magnitude along Saturn's path is the same as the average, we find that only once in 612 years will Saturn approach so near one of them as on 1886 Jan. 9. Of course, actual occultations will be still more rare, and only likely to occur by the ring once in about 1,730 years, and by the ball only once in a little over 2,000 years. So near and yet so far from an actual occultation is the coming event.

H. M. PAUL.

### THE CONVICT-LABOR PROBLEM.

THE attention of philanthropists and students of social science, which has for a long time past been turned toward this subject, has been increased of late by the attitude of the labor agitators. Perhaps not more than one out of every ten thousand laboring men gives the question of convict-labor competition a thought, but this odd one has during the last decade managed to stir up a great deal of discussion.

That convicts should be employed, and employed, if possible, in a manner profitable to the state, is a proposition that no sane man controverts. Now, there are various ways of employing convicts; and the agitators insist that one of these ways—the one, it so happens, which has in the past produced the largest revenue to the state—has an injurious effect upon the honest laborer by compelling him to submit to an unfair competition. Strange to say, this clamor has had some effect; though how sixty thousand convicts,—the whole number in the United States, according to the last census,—working as they do under peculiarly disadvantageous circumstances, and consisting of the lowest and most ignorant classes of the population, can effect any appreciable competition with the millions of honest and free workingmen, it is difficult to conceive. Those who join in this outcry are to a great extent communists, and leaders of labor organizations, whose sustenance depends upon the amount of agitation they can create, together with such political aspirants as aid them for purely selfish purposes.

The effect of all these elements combined has been visible in the statute-books of several states. Among these is New Jersey, whose legislature