

Mr. J. H. Stebbins, Jr., called the attention of the society to several new coloring materials that he had discovered among the di-amido compounds. They were yellow in color and suitable for silk, woolen and cotton dyeing, but especially desirable for the latter.

Dr. A. R. Leeds gave a short description of some new experiments on the action of hydrogen peroxide with ammonium hydrate.

A committee consisting of Mr. Casamajor and Dr. Alsberg were appointed to make arrangements for the annual dinner.

M. B.

NEW YORK, March 9, 1881.

## IMPROVED PORTABLE EQUATORIAL STANDS.

BY JAMES H. GARDINER.

The stand I use, and those which I have seen, have no levels and no means by which the telescope can be moved in azimuth without moving the whole stand. It seems to me that, with a very little trouble, these stands could be made not only a great deal more accurate, but also much more useful for amateur work by the following additions: Instead of having the equatorial mounting screwed firmly to the lower plate to which the legs are attached so the telescope cannot be moved in azimuth without moving the whole stand, a plate could be ground to touch, say, only  $\frac{1}{4}$  of an inch, and revolved on the lower plate. This would give a steadier and easier motion, with less friction than if the two plates were ground to touch all over. A thread is to be cut in the side of this upper plate, so that with a tangent screw it can be moved in azimuth. On this upper plate that revolves on the lower plate, and to which the tangent screw is attached, should be placed two levels at right angles to each other, and then on this upper plate that revolves the usual equatorial mounting is to be firmly fastened. It will be seen that the above stand only differs from the usual stands on tripods, in having levels and means to move the telescope in azimuth without moving the whole stand. Such a stand would be of great use to amateurs, who have a poor horizon, and are obliged to move their stands about to command all parts of the heavens; or for those who may have a good horizon, but cannot afford the luxury of a fixed pillar and dome. The use of such a stand will appear from the following illustration: Suppose the observer has such a stand, and that he is at Washington, and on the 1st of March, 8 P. M., he desires to put his telescope in the meridian. He carefully levels the stand, and turns his telescope on a *Polaris* to come into the centre of the field. If it does not happen to come exactly in the centre of the field, he can raise or lower his polar axis, or move the telescope in azimuth by aid of the tangent screw. Here it is to be noted that with the old stands he would have to twist the whole stand around and throw it out of level, and by repeated trials get a *Polaris* in the centre of the field, and when he again levelled the stand a *Polaris* might not be in the centre of the field. Thus every movement of the old stand would throw it out of level. All these tedious trials are obviated by the new stand with azimuth motion. When once levelled it would stay so, and the telescope could be moved to the east or west without having to be continually bothered with levelling it. Thus in a few moments he would have a *Polaris* in the centre of the field, and the telescope approximately in the meridian. He now reads his R. A. circle, and turns his telescope on some well known star, as a *Leonis* or *Regulus*, for example, and then reads his R. A. circle again. Supposing the difference of these two readings of the R. A. circle to be 3h. 25m. 13s., this is the observed hour-angle of *Regulus*. The true hour-angle of *Regulus* is equal to the difference of the Sidereal time and the R. A. of *Regulus*, or 3h. 22m. 13s. This shows that the object-end of the telescope must be moved 3m. to the west to make the observed hour-angle agree with the true

hour-angle. This can be done nicely by the tangent screw that moves the telescope in azimuth without throwing it out of level, but with the old kind of stand it would be thrown out of level, and it would be a very tedious job, requiring time and patience to accomplish. Having got the telescope very nearly in the meridian, the declination circle can now be set to the  $\delta$  of the star. With such a stand the careful amateur can put it near enough in the meridian to pick up a comet or any other object by its R. A. and  $\delta$ . The accuracy of the adjustments depends upon the levelling, the collimation, and an exact value of the local time. The levelling would generally be accurate enough, and most stands have screws in the saddle that carries the telescope for correcting the collimation. But the amateur should try to get the exact value of his local time, as this would probably introduce the greatest error. This can be done by equal altitudes of the sun or star. Or where the latitude of the place is well known the local time may be found by an altitude of the sun. With such a stand as has been described, if it should be necessary to move it to another place, it could easily be put in the meridian again, as described. Besides, many have stands with good circles which they seldom use, because they cannot afford a fixed pillar and dome, and do not care to put it in the meridian, as they are obliged each night to bring the telescope into the house. But if it could be put in the meridian easily, I am sure many would be pleased to use their circles.

## ASTRONOMICAL MEMORANDA.

[Approximately computed for Washington, D. C., Monday, March 21, 1881.]

Sidereal time of mean noon,  $23^h, 57^m, 24^s$ . Equation of time,  $7^m, 8^s$ . Mean noon preceding apparent noon.

On the morning of March 20th, the sun crosses the equator and enters the constellation Aries, thus indicating the commencement of Spring. The violent actions upon the sun's surface have continued throughout the past month.

The moon reaches its last quarter on March 22, and is new again on the 29th. On March 21st, she crosses the meridian at 4 A. M. The moon will be in conjunction with Mercury on the 27th, and with Jupiter and Saturn on the morning of the 31st.

Mercury is morning star, crossing the meridian about an hour before the sun, nearly 6 degrees farther south. Mercury was in interior conjunction with the sun on the 11th and is travelling towards the west.

Venus has been moving westward since her greatest eastern elongation on the 20th of February, and will continue to increase in brilliancy till March 27th. She crosses the meridian at about 2.40 P. M., about 20 degrees farther north than the sun.

Mars, crossing the meridian nearly 3 hours in advance of the sun, is coming towards us, and gradually increasing in brilliancy.

Jupiter crosses the meridian at about 1.15 P. M., and Saturn 15 minutes later. They are both becoming very unfavorably situated for observation, and must be looked for immediately after sun-set.

Uranus is in right ascension  $10^h, 50^m, 47^s$ ; declination  $8^\circ 14'$  north, and was in opposition on March 1st.

Neptune, right ascension  $2^h, 47^m, 17^s$ ; declination  $13^\circ 56'$  north. Neptune and Venus are in conjunction on the 23rd.

THE following is a list of the officers and council of the Royal Astronomical Society, elected February 11, 1881:—President: J. R. Hind; Vice-Presidents: Prof. Cayley, E. Dunkin, W. Huggins, E. J. Stone; Treasurer: F. Barrow; Secretaries: W. H. M. Christie, J. W. Glaisher; Foreign Secretary: the Earl of Crawford; Council: Prof. Adams,