

the air in immediate contact with the roof and thus to injure the definition of the heavenly body seen from within the observing rooms in the day-time. To avoid this difficulty the roof is covered with soil and sodded with green turf and thus kept as cool as the surrounding air, how hot soever the sun's rays may be. It is of course necessary to keep the turf watered. Possibly any other absorbent substance might answer the purpose of the turf, but the latter has at least the advantage of cheapness.

It is a common feature of all, or nearly all the continental observatories, that quarters are provided for the astronomers, generally in the building itself. This offers the great advantage that the astronomers are nearly always near their instruments, and may be regarded as absolutely essential to the efficiency of any large observatory, especially if it is not in the midst of a city. At Potsdam the houses of some of the astronomers are separated from the building, but the general rule is that the building accommodates the director and such of the assistants as are engaged in actual observations, together with their families. This collection of several families in the same building is more accordant with European habits than with our own, and the question of its introduction among us can be settled only by careful consideration. I can only say that I noticed no serious inconvenience arising from it.

CLOCKS.

In most astronomical work of the first class, especially in meridian observations, the perfection of the clock is as necessary as that of any other instrument. But it seems to be an observed fact that no certain way has yet been found of securing an approach to perfection in the rate of the clock. All we can say is, that clocks of marvelous excellence are now and then made, sometimes by one maker and sometimes by another, and that of these clocks some are permanently good while others, in the course of time, deteriorate. I found a few examples of clocks preserving their rate with remarkable uniformity through considerable periods. One of these is the Normal clock of the Berlin Observatory, made by Tiede. It is inclosed in an air-tight case in order to prevent changes of rate arising from variations in the barometric pressure. The temperature compensation is unfortunately imperfect, so that the rate is subject to an annual change. This fact has prevented the exact discussion to which I desired to subject it. It would seem, however, from a cursory examination, the materials for which were courteously afforded me