

may possibly be due to the fact that the tabular results do not refer in each case to the same interval of time and they were not deduced by one common method.

#### MINOR PERIODIC FLUCTUATIONS.

Of these may be mentioned the *variation depending upon the solar rotation*, having a period of about 26 days, and the *variation depending upon the position of the moon with reference to the sun and the earth*. The ranges, or differences between extreme values of both of these variations, are so minute that it requires many years of continuous and carefully made observations to detect them.

#### MAGNETIC STORMS.

Generally speaking, these may occur at any time and are frequently accompanied by auroral displays. Such storms may at times have a very wide circle of action and occur practically simultaneously over the whole area. Thus on December 3d, 1896, while I was on my way to Salisbury to establish a meridian line for Dorchester county, I saw in the evening a most brilliant aurora, and the next day while making magnetic observations the behavior of my needle plainly indicated that a magnetic storm was prevailing. I have since then received from a magnetic observatory at Bochum, Germany, established in connection with a mining plant, the tabulated hourly values of the magnetic declination during 1896 and I find that the magnetic storm of December 4 likewise made its appearance at this distant place.

The deviations caused by these spasmodic fluctuations in the earth's magnetism may in these latitudes occasionally amount to as much as 10'-20' and even more. On October 12th, 1896, I made observations at Oakland at various times during the day. The diurnal variation on that day was completely reversed, the highest value occurring in the morning, instead of in the afternoon, and the lowest value in the afternoon, instead of the morning. My first observation in the morning required a correction of -16'.

Small spasmodic fluctuations occur frequently. Thus, according to