

which we are familiar, and by experience know to be productive of benefit. The security of past ages against injury from celestial appearances would not be sufficient, in all instances, to quiet our fears; but, ignorant of the mysterious motions we observe, thought might suggest new causes of terror, while the illiterate and superstitious would be constantly exposed to the imposition of the crafty.

By the knowledge that has been acquired, we are made confident that we are in a state of being where natural phenomena are curbed and regulated by the very causes of motion; and if we had not the confidence of security arising from this knowledge, we could not be certain that the appearances we now behold with delight, might not hereafter exert an influence to our detriment or destruction; and there could be no reason why we should not believe that the seasons might be changed into a perpetual arctic winter, or a worse than tropical summer; or that some wandering comet might not in its eccentric course destroy this fair world of ours. It would not be sufficient to say that such evils have not as yet occurred, for that is not a pledge that they will not hereafter happen. We might therefore be justified in indulging the most gloomy apprehensions of the future fate of the earth, if we were ignorant of the causes that regulate the celestial phenomena we occasionally or daily see, and be perplexed with the visionary theories of those who seem to have no other employ than seeking a temporary fame in the deception of others.

By the expression "celestial appearances" we do not intend to include all those phenomena we behold in the heavens, but those only which are connected with the conditions and motions of the celestial bodies. There are many phenomena which have their origin in the region of the clouds, such as lightning, and the aurora borealis; to these we shall make no reference in this chapter, but introduce an explanation of them when considering the causes from which they derive their origin. The most striking celestial appearances, and those to which allusion will be made in this place, are Comets, Nebulæ, Eclipses, and the Phases of the Moon.

#### COMETS.

Comets were long beheld with a feeling of superstitious awe as the harbingers of evil. Reasoning from assumed prin-