

spheric air, we have a datum by which to calculate its extent. If the density were the same throughout, this would be an extremely simple problem; for, by ascertaining the weight of a column of air of any dimensions, and the height of a column of water of the same dimensions, we might, by a simple equation, discover the height of the atmosphere. But as the rarefaction increases with the altitude, it is a somewhat complex and difficult problem to ascertain its height. This may, however, be approximately determined by another method. It is generally known that twilight is a phenomenon resulting from the refraction and reflection of solar light after the luminary has descended below the horizon. Now from calculations made by Dr. Wollaston, founded upon the known law of decreasing density, it is certain that at the height of about forty or forty-five miles, the atmosphere does exist, and in such a state that it influences the direction of light. If we calculate its extension by the length of our twilight, we shall be brought to nearly the same result. It is also found capable of conveying sound at the height of sixty-nine miles. Thus, although it is almost impossible to say in respect to the atmosphere, thus far it extends and no farther, yet there are methods by which it is possible to acquaint ourselves with its existence and conditions within certain limits.

#### ADAPTATION OF THE ATMOSPHERE TO ANIMALS.

In the consideration of the principles and phenomena to which we have referred, the mind is especially interested by their adaptation to the physical or intellectual wants of animals. The senses are as capable of becoming the media of painful as of pleasurable sensations, and nothing but an admirable application of external agencies preserves us from those violations of sensibility to which our constitution renders us liable. The very capabilities of enjoyment that are possessed by man and inferior creatures, would have acted as a curse, had not external nature been in concord with them. Instead of the elastic and enlivened feelings with which we now look upon the face of nature, it might have been the source of constant annoyance; and thus the very capabilities by which man is distinguished, might have become the increasing causes of pain and discomfiture. **But** by the arrangements which the Creator has adopted, man is