

six thousand years. By thy voice they still converse with us, although to human ears they speak no more; by thy realizing aid they visit us in our darkness with kindness and consolation; by thy light we see a cloud of them as witnesses encamped around us; and whatever grace they experienced is, through thee, appropriated to ourselves. Thou nourishest us with the promises made to Abraham, sustainest us with the strong consolation of the oath divinely sworn unto Isaac; thou givest us the staff of Jacob to support our steps; thou enablest us with Moses' rod to divide the sea, and with David to leap over the wall and rampart! O faith, faith! thou doorkeeper of every sanctuary, thou master over all the treasures of God! may He who is thine Author draw near unto us; and He who is thy Finisher bend down himself towards us!—*Krummacher.*

CABINET OF SCIENCE.

THE PROPERTIES OF LIGHT WITH REGARD TO VEGETATION.—The illuminating power of light will come under our consideration hereafter. Its agency, with regard to organic life, is too important not to be noticed, though this must be done briefly. Light appears to be as necessary to the health of plants as air or moisture. A plant may, indeed, grow without it, but it does not appear that a species could be so continued. Under such a privation, the parts which are usually green, assume a white colour, as is the case with vegetables grown in a cellar, or protected by a covering for the sake of producing this very effect; thus, celery, is in this manner blanched, or *etiolated*.

The part of the process of vegetable life for which light is especially essential, appears to be the functions of the leaves; these are affected by this agent in a very remarkable manner. The moisture which plants imbibe is, by their vital energies, carried to their leaves; and is then brought in contact with the atmosphere, which, besides other ingredients, contains, in general, a portion of carbonic acid. So long as light is present, the leaf decomposes the carbonic acid, appropriates the carbon to the formation of its own proper juices, and returns the disengaged oxygen into the atmosphere; thus restoring the atmospheric air to a condition in which it is more fitted than it was before for the support of animal life. The plant thus prepares the support of life for other creatures at the same time that it absorbs its own. The greenness of those members which affect that colour, and the disengagement of oxygen, are the indications that its vital powers are in healthful action: as soon as we remove light from the plant, these indications cease: it has no

longer power to imbibe carbon and disengage oxygen, but on the contrary, it gives back some of the carbon already obtained, and robs the atmosphere of oxygen for the purpose of re-converting this into carbonic acid.

It cannot be well conceived that such effects of light on vegetables, as we have described, should occur, if that agent, of whatever nature it is, and those organs, had not been adapted to each other.—*Whewell.*

THE STABILITY OF THE SOLAR SYSTEM.—There is a consequence resulting from the actual structure of the solar system, which has been brought to light by the investigation of mathematicians concerning the cause and laws of its motions, and which has an important bearing on our argument. It appears that the arrangement which at present obtains is precisely that which is necessary to secure the *stability* of the system. This point we must endeavour to explain.

If each planet were to revolve round the sun without being affected by the other planets, there would be a certain degree of regularity in its motion; and this regularity would continue for ever. But it appears, by the discovery of the law of universal gravitation, that the planets do not execute their movements in this insulated and independent manner. Each of them is acted on by the attraction of all the rest. The earth is constantly drawn by Venus, by Mars, by Jupiter, bodies of various magnitudes, perpetually changing their distances and positions with regard to the earth; the Earth in return is perpetually drawing these bodies. What, in the course of time, will be the result of this mutual attraction?

All the planets are very small compared with the sun, and therefore the derangement which they produce in the motion of one of their number will be very small in the course of one revolution. But this gives us no security that the derangement may not become very large in the course of many revolutions. The cause acts perpetually, and it has the whole extent of time to work in. Is it not easily conceivable then that in the lapse of ages the derangements of the motions of the planets may accumulate, the orbits may change their form, their mutual distances may be much increased or much diminished? Is it not possible that these changes may go on without limit, and end in the complete subversion and ruin of the system?

If, for instance, the result of this mutual gravitation should be to increase considerably the eccentricity of the earth's orbit, that is to make it a longer and longer oval; or to make the moon approach perpetually nearer and nearer the earth every revolution; it is easy to see that in the one case our year would change its character in the other, our satellite might finally fall to the earth, which must of course bring about a dreadful cata-