

This movement of rotation corresponds, therefore, to that of an equatorial round the axis of right ascension. To obtain the second movement of rotation corresponding to that of an equatorial round the axis of declination, a new box carrying a mirror inclined at 45 deg. to the objective can be moved circularly round the latter. This box is open in front of the mirror; consequently the first or interior mirror and the objective can move in a plane perpendicular to the tube of the lunette, while the second or external mirror which receives all the rays before they are sent to the observer possesses two movements, one in a plane also perpendicular to the tube of the lunette, the other in a plane at right angles to this latter movement. As in M. Lœwig's instrument the observer can be comfortably seated at his work, the tube of the lunette can be constructed in masonry if necessary, and as only the movable part, which is very small, requiring protection, the expense of a dome is saved.—*Engineering.*

THE AGE OF THE EARTH.—Richard A. Proctor says that the age of the earth is placed by some at 500,000,000 years; and still others of later time, among them the Duke of Argyll, place it at 10,000,000 years. None place it lower than 10,000,000, knowing what processes have been gone through. The earth must have become old. Newton surmised, although he could give no reason for it, that the earth would at one time lose all its water and become perfectly dry. Since then it has been found that Newton was correct. As the earth keeps cooling it will become porous, and great cavities will be formed in the interior which will take in the water. It is estimated that this process is now progressing so fast that the water diminishes at the rate of the thickness of a sheet of writing paper a year. At this rate in 9,000,000 years the water will have sunk a mile, and in 15,000,000 years every trace of water will have disappeared from the face of the globe.

THE ANTIGNITY MERCURY.—A recent writer in the North China *Herald* discusses the part played by mercury in the alchemy and materia medica of the Chinese. Cinnabar was known to them in the seventh century before the Christian era, and its occurrence on the surface of the earth was said to indicate gold beneath. Their views on the transformation of metals into ores and ores into metals by heat and other means took the form of chemical doctrine about a century before Christ, and there is now no reasonable doubt that the Arabian Geber and others (as stated by Dr. Gladstone in his inaugural address to the Chemical Society) derived their ideas on the transmutation of metals into gold and the belief in immunity from death by the use of the philosopher's stone from China. Among all the metals with which the alchemist worked mercury was pre-eminent, and this is stated to be really the philosopher's stone, of which Geber, Kalid, and others spoke in the times of the early Caliphs. In China it was employed excessively as a medicine. On nights when dew was falling a sufficient amount was collected to mix with the powder of cinnabar, and this was taken habitually till it led to serious disturbance of the bodily functions. In the thirteenth century an emperor, and in the tenth a prime minister, died from overdoses of mercury. Chinese medical books say it takes two hundred years to produce cinnabar; in three hundred years it becomes lead; in two hundred years more it becomes silver, and then by obtaining a transforming substance called "vapor of harmony" it becomes gold. This doctrine of the transformation of mercury into other metals is 2,000 years old in China. The Chinese hold that it not only prolongs life, but expels bad vapors, poison, and the gloom of an uneasy mind.

VEGETABLE SILK.—A German technical journal gives some details as to a vegetable substance, somewhat resembling silk, to which attention has lately been drawn by its having been exhibited in Greece. It is stated that this substance is a silky haired portion of a tree-like shrub, which came originally from America, but is found in Syria and the south of Europe (*Asclepias Syriae*), of the family of Asclepiades. It is also known as the Syria silk plant. The substance in question is used for stuffing very soft cushions. When mixed with silk and wool, the Syrian silk is said to be used in different tissues. The milky juice of the plant is poisonous, and the tough stalks can be used in the same manner as the corresponding portions of the hemp plant. An English exchange, which has seen a specimen of this fibre, says: "It is certainly very beautiful, soft to the touch, and very silky in appearance. Whether it is likely to be used

largely for manufactures is quite another matter, and upon which no off-hand opinion would be worth much.

A NEW EXPLANATION OF MENTAL AND NERVOUS DISORDERS.—Dr. B. W. Richardson has offered a new and plausible explanation for the occurrence of various forms of mental and nervous disorders, namely: that they depend for their development on the presence in the body of certain organic compounds, formed by certain unnatural or abnormal chemical processes carried on within the body itself. He has proved that the substance amylen—an organic product that is sometimes formed in the body—produces phenomena identical with somnambulism. He believes from his researches upon the action of lactic acid, that the presence of this substance in the body will account for certain forms of heart disease and rheumatism. Similarly he advances other suggestions as to the probable effect of other chemical compounds of poisonous nature which he believes may be developed in the body by abnormal processes, and discusses their possible relation to the causation of special forms of disease.

LENGTH OF OUR LIVES INCREASING.—At a recent international health exhibition held in London, Sir James Paget delivered an address before the association, the Prince of Wales being present. The learned physician asserted that people live longer than formerly, and that less sickness prevails among the mass of people, and he then gives the following reasons for the decrease of mortality during the last few years: "There is less from intemperance, less from immorality; we have better, cheaper and more various food, far more and cheaper clothing, far more and healthier recreations. We have, on the whole, better houses and better drains, better water and air, and better ways of using them. The care and skill with which the sick are treated in hospitals, infirmaries, and even in private houses, are far greater than they were; the improvement and extension of nursing are more than can be described; the care which the rich bestow on the poor when they visit them in their own homes, is every day saving health and life; and even more effectual than any of these is the work done by the medical officers of health and all the sanitary authorities now active and influential in every part of the kingdom. But we want," adds the lecturer in closing, "more ambition for health—a personal ambition for renown in health as keen as is that for bravery or for beauty, or for success in our athletic games and field sports."

THERMAL COLOURED RINGS.—M. Decharme, whose experiments on the flow of currents in pipes and their hydro-dynamic analogy to electric currents have attracted much attention, has also recently drawn attention to the fact that thermal coloured rings bear a striking resemblance to electro-chemical coloured rings. When a copper plate is exposed to the flame of a spirit lamp or a Bunsen burner, an irised or rainbow coloured corona is produced about the heated point. Under good conditions these colours are fixed and unalterable in the air. These rings are, according to M. Decharme, quite similar to Nobili's electro-chemical rings; like the latter they succeed each other in waves, the colours being in the same order, namely, that of Newton's rings viewed by transmission.

SUBMARINE CABLES.—The Faraday is now engaged in laying the second Bennet-Mackay Atlantic cable from Kenmare Bay in Ireland to Canso in America. Dr. Muirhead is at present at the Irish station fitting up his duplex system on the cable already laid, and we understand that he will shortly proceed to America to complete the work there. With both the new cables duplexed, the company will have practically four cables at their disposal to compete with the existing lines, and we believe that arrangements have been made with an American telegraph company to give them a land continental system of lines, as well as a sub-Atlantic system. The combination may therefore prove a formidable rival to the Western Union Telegraph Company if it can keep out of the hands of the present powerful monopolies. While upon this subject we may mention the singular case of a living whale, 70 ft. long, being recently caught in one of the West Coast of America Telegraph Company's cables by Captain Morton, of the company's repairing ship. The whale was hauled up to the ship's bows in the cable while being repaired, and the wire cutting into its flesh caused the entrails to escape. The whale drifted to windward dead after the cable parted with the strain. The supposition is that the whale produced the faults in the cable, which was being repaired, by getting entangled in the latter. If so, it must have been caught seven days.