

**On the Origin of Planets and their Satellites.** BIRKELAND. (*Mon. Sci.*, lxxviii, 853, 64.)—Guided by experimental analogies, M. Birkeland has been led to believe that in the solar systems now in evolution there exist certain forces of electromagnetic origin of the same order of magnitude as that of gravitation, and that these forces, acting in concert, have given birth around the sun to planets having nearly circular orbits, situated approximately in the same plane, to the moons, and to the rings around the planets; and to the nebulae both in the shape of rings and spirals. The most distant moons, recently discovered near Jupiter and Saturn, with their *retrograde* revolution, do not invalidate this theory; on the contrary, this retrogression suggests that if new planets are discovered sufficiently distant from Neptune, they, too, should have a retrograde revolution around the sun. As the fundamental supposition it is affirmed that all the suns, in comparison with the space of the universe, have an enormous electronegative tension, which differs for the various stars, but which, to give an idea of its magnitude, approximates 600,000,000 volts for our sun and for all suns of a similar class. By means of experimental analogies he endeavors to show how a magnetic field can thus form itself around a star, with its axis the length of its axis of rotation, and how the electric discharges issuing from the central body would, by preference, produce themselves around the equatorial magnetic plane with a continual projection of material electrified particles, which continue their course in the same plane.

**The Effect of Acids and Oils on Concrete.** W. L. GADD. (*Engineering*, xcv, 20.)—Even exceedingly dilute mineral acids dissolve some of the constituents of Portland cement. Organic acids have less effect, but they combine with the calcium hydroxide liberated when the cement is gauged with water. The author's experiments lead to the conclusion that the addition of oil or fat of any kind to concrete weakens it. Animal and vegetable oils have a direct action on green concrete and finally destroy it, owing to the saponification of glycerides by calcium hydroxide. Indurated concrete is not attacked to the same extent. Mineral oils, though there can be no saponification in this case, weaken mortar to some extent, even when only small proportions of oil are used, and the resulting concrete is less waterproof than dense mortars in which the aggregates are properly graded to fill the voids.

**Egypt's Debt to the Engineer.** ANON. (*Sci. Amer.*, cvii, No. 23, 477.)—The Assouan dam and other irrigation works in Egypt have cost about \$53,000,000; but the increase in the value of land in middle and lower Egypt and the Fayum provinces has been from \$955,000,000 to \$2,440,000,000. The total rent of this land has risen from \$82,000,000 to \$190,000,000. This is what the engineer has done for Egypt in less than twenty years.