

**MAGNÉTISME ET ÉLECTRICITÉ TERRESTRES**  
(TERRESTRIAL MAGNETISM AND ELECTRICITY)

by  
CH. MAURAIN

Part I.

*Terrestrial Magnetism.*

62 pp. - Publication N° 287 of the *Actualités Scientifiques et Industrielles*  
HERMANN et C<sup>ie</sup>, Publishers, Paris, 1935.

This volume presents a very concise and well-documented study of the causes of terrestrial magnetism. The new concepts, particularly the theories of the electrified ions, present the explanations regarding terrestrial magnetism and atmospheric electricity in a manner which approaches more closely to the reality of these phenomena. With the aid of 75 observatories where regular magnetic observations are carried out over the entire globe, the advancement in our knowledge of the distribution of the magnetic field, and its analysis by the Gauss method, have greatly enhanced our comprehension of the subject. The studies of the anomalies show a definite relation between the composition of the subsoil and the geology.

This work reviews successively the general concepts relating to the terrestrial magnetic field, its periodic modifications, its accidental perturbations and their relation to solar phenomena, the polar aurora and the telluric currents. The two final chapters treat of the theories relative to the perturbations and the polar aurora, as well as the research directed towards the determination of the origin of the terrestrial magnetic field — a problem of prime importance which has not yet been solved. The analysis of the magnetic field indicates that it is due for the greater part to actions arising from the interior of the globe, but it is hardly probable that the internal portions of the globe, where very high pressures and temperatures exist, should be highly magnetised.

For the rest, it is subjected to a general magnetisation of the layers closest to the surface, which go to produce the greater part of the terrestrial magnetic field. The present tendency is to consider these actions as coming from the interior of the globe, as products of the internal currents due to the influence of the rotating motion of the earth, although the axis of the magnetic field does not coincide exactly with the earth's rotational axis and makes an angle with it of 11 to 12°. This lack of symmetry may result from an unsymmetrical distribution of temperature within the globe. In establishing an analogy between the magnetic field of the sun and that of the earth, — which turns in the same direction, and which has a similarly distributed magnetic field, — we may discern in the movement of the sun spots an indication of a circulation of a type suitable to the interpretation of the secular variations. However, the electric conductivity of the interior of the globe and its distribution are not well enough known at the present time to permit us to evaluate with any degree of accuracy the effects of induction produced by these internal movements, but it appears to be rather an enticing concept to follow and one which may possibly bring an important contribution to the research into the origin of the terrestrial magnetic field, which still remains a mystery.

**FOG-PIERCING LIGHTS.**

(Extract from an article of *The Pennsylvania Engineer*, Vol. I, N° 2,  
published in the *Journal of the Franklin Institute*, Philadelphia, April 1936, page 577)

GJON MILI of the Westinghouse Lamp Co. before a joint meeting of the American Physical and Optical Society of America stated that for years research engineers have unsuccessfully sought a new source of color for light that would penetrate fog at a distance safe for aerial and marine navigation. Only recently, however, have engineers