variations of eccentricity could affect climate to such an extent, and on the other, he thinks Croll's whole chain of argument valueless, since, excellent as it is, astronomy has not yet ascertained with any security that there have been periods of very great eccentricity of the orbit. Poisson (1837) suggested that climatic variations might result from movement of the solar system through warmer and colder portions of space; other authors have suggested changes in the obliquity of the ecliptic or a shifting of the earth's axis as possible causes of variation, but science has not yet arrived at any generally accepted solution of the difficult climatic problem of the Ice Age.

D. *Geological Action of Organisms.*—Scientific research has abundantly shown how subtle is the chemistry of life, and how important and complex is the part played by the organic world in the economy of nature.

Plants and animals abstract from the atmosphere, from the soil and the rocks, certain inorganic constituents which enter into new chemical combinations in the active tissues of the living organisms, and are partly assimilated, partly returned in altered form to the atmosphere and the ground.

Animal creation thus serves as an intermediary between the atmosphere and the earth's surface, utilising and metabolising matter derived from both, and effecting transferences from the one to the other.

The present action of living organisms upon the earth's surface is therefore partially to destroy, partially to renew and enrich it; and similar functions were fulfilled by living organisms in past ages. But more important for geology than the changes effected by metabolism and mineral decomposition is the consideration of the additions made to rock-deposits by the accumulation of organic remains.

The destructive effects of plant-growth are produced in virtue both of chemical and mechanical agencies. When plants decay, organic acids develop, and, as Bischof and more recently Julien have shown, these have a strong solvent and oxidising action upon the surrounding mineral matter. More especially when combined with water they promote rapid decomposition of the rocks, and their disintegrating action, productive of soil, may be traced to considerable depths below the surface. The roots of plants as they penetrate downward through the rock-fissures exert a certain mechanical force upon