of the sea. This extended insight into the co ɔction of natural phenomena is the result of the philosop ɹical direction which has been so generally assumed by the more earnest study of geognosy. Increased cultivation of science and enlargement of political views alike tend to unite elements that had long been divided.

If, instead of classifying rocks according to their varieties of form and superposition into stratified and unstratified, schistose and compact, normal and abnormal, we investigate those phenomena of formation and transformation which are still going on before our eyes, we shall find that rocks admit of being arranged according to four modes of origin.

Rocks of eruption, which have issued from the interior of the earth either in a state of fusion from volcanic action, or in a more or less soft, viscous condition, from Plutonic action.

Sedimentary rocks, which have been precipitated and deposited on the earth's surface from a fluid, in which the most minute particles were either dissolved or held in suspension constituting the greater part of the secondary (or flötz) and tertiary groups.

Transformed or metamorphic rocks,* in which the internal texture and the mode of stratification have been changed, ei-

* [As the doctrine of mineral metamorphism is now exciting very general attention, we subjoin a few explanatory observations by the celebrated Swiss philosopher, Professor Studer, taken from the *Edinb. New Philos. Journ.*, Jan., 1848: "In its widest sense, mineral metamorphism means every change of aggregation, structure, or chemical condition which rocks have undergone subsequently to their deposition and stratification, or the effects which have been produced by other forces than gravity and cohesion. There fall under this definition, the discoloration of the surface of black limestone by the loss of carbon; the formation of brownish-red crusts on rocks of limestone, sandstone, many slate stones, serpentine, granite, &c., by the decomposition of iron pyrites, or magnetic iron, finely disseminated in the mass of the rock; the conversion of anhydrite into gypsum, in consequence of the absorption of water; the crumbling of many granites and porphyries into gravel, occasioned by the decomposition of the mica and feldspar. In its more limited sense, the term metamorphic is confined to those changes of the rock which are produced, not by the effect of the atmosphere or of water on the exposed surfaces, but which are produced, directly or indirectly, by agencies seated in the interior of the earth. In many cases the mode of change may be explained by our physical or chemical theories, and may be viewed as the effect of temperature or of electro-chemical actions. Adjoining rocks, or connecting communications with the interior of the earth, also distinctly point out the seat from which the change proceeds. In many other cases the metamorphic process itself remains a mystery, and from the nature of the products alone do we conclude that such a metamorphic action has taken place.]—*Tr.*