



X. Agenda, or a collection of observations and researches the results of which may serve as the foundation for a Theory of the Earth

M. de Saussure

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drop or thin coating of nitrous acid; and beyond all expectation, when you take a silver bow having a little sulphure of pot-ash adhering to the end of it.

Fig. 19 represents the form of this experiment, where *g* is the frog, *a, a* the two glasses with water, *A* the bow formed of one single metal, and *m* the drop or a thin stratum of a mucous, saline, &c. fluid with which the bow has been rubbed over, and which on this side is between the metal and the water.

[To be continued.]

X. Agenda, or a Collection of Observations and Researches the Results of which may serve as the Foundation for a Theory of the Earth. By M. DE SAUSSURE.*

[Continued from page 299 of Vol. III.]

CHAP. XV.

Observations to be made on primitive Mountains.

1. **W**HETHER there be any exception to the generally received opinion, that, in primitive mountains, no vestiges are discovered of organised bodies.

2. Whether it be true that in these mountains no indications are found of bitumen or marine salt.

3. To endeavour to determinè the respective ages of the different kinds of primitive mountains; both compound, such as granite, porphyry, gneiss; and simple, as slate, serpentine, and primitive calcareous.

4. Whether, in particular, it be certain that granite is the most ancient stone of all those which form the outer crust of our globe, so that it is never found placed above (*superposé*) any other kind of stone.

* From Journal des Mines, No. XX.

5. Whether

5. Whether the large mountains composed of granite in one mass, even the best characterised, do not give certain indications of stratification or divisions by strata, though less regular than those of schistous mountains.

6. Whether in the bases of granite mountains the manifestation of strata be not hurt by the number of fissures, or spontaneous and irregular divisions.

7. Whether, even in the separate blocks of granite, an attentive eye does not discover some veins of mica, which affect the same direction, and such veins as induce the workmen, who wish to make mill-stones or other works more extensive in one direction than another, to prefer attacking the stone in a determined direction.

8. Whether the indications of the stratification are not observed in the interior part of granite mountains, as well as near their surface.

8. A. Whether among the granites in a mass, and those decidedly veined, there are not found such intermediary shades that it is difficult to mark the line of separation.

9. To determine the distinguishing characters of granites of modern formation.

11. To ascertain the truth of the assertion of the Pliny of France, that in proportion as people dig into a mountain, the summit and sides of which consist of granite, the granites, instead of being found more solid and more beautiful the farther they advance, change, on the contrary, below a certain depth, lose themselves, and at last vanish by gradually assuming the coarse (*brute*) nature of the live quartz rock*.

12. Whether it be true that each primitive mountain is generally composed of one single stone, and of the same nature.

13. To examine whether there be found on the primitive mountains, at great heights, the scattered wrecks of secondary mountains. For my part, I never found any.

14. Whether primitive calcareous stone be found always

* Mineraux, p. 105.

with a granulated fracture, or the form of a saline marble, and never under a compact form.

15. Ought the porphyric schist of Werner, or the *porphyre schisteux à pâte* of primitive petro-felix, to be considered as primitive or secondary? The same question in regard to the *mandelstein* or amygdaloid.

16. Is it fully ascertained, as I thought I observed in the Alps, and M. de Fichtel in the Carpathian mountains, that there exists pudding-stone or free-stone, if not primitive, at least of a formation anterior to that of all the other secondary stones?

17. Were the granites in a mass first deposited, because they were less soluble? and did they crystallise after the quantity or dissolving force of the waters began to diminish? and was it for a contrary reason that the gneiss, mica and magnesian stones crystallised later?

CHAP. XVI.

Observations to be made on Transitions.

1. To observe the intermediary genera and species of fossils, between one genus or one species of fossil, and the genera and species which have the greatest resemblance to them.

2. To observe, above all, the transitions through which nature has passed, when, having produced one genus or one order of mountains, she began to produce a different genus or order; for there is no change of order which has not been the effect of a revolution; and it is in the transitions that traces of these revolutions are to be found.

3. Thus we often see strata of free-stone or pudding-stone interposed between the primitive and secondary mountains; *breches* are seen to form the most elevated stratum, and consequently the newest of some calcareous mountains. We must study then the nature, dimensions and position of these remarkable strata.

4. Having

4. Having found these transitions, or any others, in some mountains, if they are not then found in other mountains, you must examine whether their absence does not arise from their having been destroyed; vestiges of them are to be sought for; and if it appears that they never existed, you must endeavour to discover, in the nature and position of the mountains, what may have been the cause of their absence*.

[To be continued.]

XI. *Observations on the Manufacture of the Acetite of Copper or Verdigrise, Verdet, &c.* By J. A. CHAPTAL.†

THE acetite of copper is one of the preparations of that metal most frequently used in the arts. It is not only one of the principal resources of painting, but upon many occasions is employed with great advantage in dyeing. Almost all the oxydes of copper obtained by the action of saline substances have a blue colour, more or less inclining to green, and almost all the neutral salts corrode the metal, and produce that oxyde which is called verdigrise. It is sufficient to bring them into contact with the copper, or to immerse the metallic plates in a saline solution, and afterwards to expose them to the air to dry.

Those acids which oxydate the copper by their decomposition, produce an effect like that of neutral salts. The oxyde is of a soft blueish-green colour; their action is so speedy, that if the copper be exposed to the vapour of them for some minutes its surface will be immediately oxydated. The oxygenated muriatic acid produces that effect as well as the vapour of the nitric acid, and even those of the sulphuric acid. A phenomenon which cannot escape the eye of an

* The best method of observing mountains, in order to acquire a thorough knowledge of them, is, not to confine oneself merely to follow the valleys, but to intersect also, as much as possible, the principal chains and the branches detached from them in the direction of their breadth. C.

† From *Annales de Chimie*, No. LXXV.