

great mass of sedimentary strata permeated by water. As heat from beneath invades these sediments, it produces in them that change which constitutes normal metamorphism. These rocks at a sufficient depth are necessarily in a state of igneo-aqueous fusion, and then in the event of fracture of the overlying strata, may rise among them, taking the form of eruptive rocks. Where the nature of the sediments is such as to generate great amounts of elastic fluids by their fusion, earthquakes and volcanic eruptions may result, and these, other things being equal, will be most likely to occur under the more recent formations.

## ON THE ASSAYING OF COALS BY THE BLOWPIPE.

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*Read before the Canadian Institute, 16th January, 1858.*

The blowpipe had been employed with great success for nearly a century in the examination of minerals and chemical products, with a view to distinguish these numerous bodies from one another, and also to ascertain their general composition, when Edward Harkort of Freiberg first applied it to the quantitative investigation of certain silver ores and furnace products. Plattner, who had worked with Harkort, subsequently extended this application to the assaying of various metallic substances, and added in no small degree to the utility of the instrument, by the invention of new methods of research and many new appliances, published collectively in his well-known *Probirkunst mit dem L  throhre*.<sup>\*</sup> No one, however, has yet attempted to employ the blowpipe in the practical examination of coals, an application peculiarly fitted to it: since, in travelling, and at other times when only the blowpipe-apparatus can be conveniently made use of, determinations of the kind in question are often desirable. Having had some experience in the use of the instrument, I have attempted to supply this

<sup>\*</sup> This work reached in 1833 its fourth edition. Harkort's earlier publication (1827), of which, however, merely the first part was issued, bore a similar title. For all that concerns the history and general application of the blowpipe, the reader may consult the fourth edition of the standard work by Berzelius, as translated by Whitney. A new edition of this work, incorporating the various tests and discoveries published since the death of its distinguished author, is much required.