

the fuels of the outer or most eastern belt have all the characters of lignite *, those of the central belt (and consequently somewhat nearer the mountains), the lignitic coals *, have a character intermediate between that of lignite and true coal, whilst those of the innermost belt, and therefore close to the base of the mountains, have all the characters of true coal *—finally we have occurring in the mountains, the anthracitic coal and semi-anthracite.

The coal of the Wellington mine, Vancouver Island, British Columbia, has been selected as a standard of comparison. It is of the same geological age as many of the fuels here referred to—is extensively used, and has the reputation of being an excellent fuel for steam and domestic purposes.—See analysis No. 33.

BRIEF OUTLINE OF SOME OF THE METHODS EMPLOYED IN THE PROSECUTION OF THIS ENQUIRY.

Methods of
analysis, etc.

I. DETERMINATION OF THE SPECIFIC GRAVITY.—The coal or lignite was reduced to the state of a coarse powder by crushing it in an iron mortar, the application of more force than was absolutely necessary to effect this being carefully avoided, so as to obviate, as far as possible, the production of fine particles and dust. The material was subsequently freed from this latter by shaking it upon a sieve of ninety holes to the linear inch. The specimen having been introduced into the specific gravity bottle, and sufficient water added to thoroughly immerse it, the whole was placed under the receiver of an air-pump, and exhaustion very gradually proceeded with: the exhaustion was repeated at intervals and until no more bubbles were seen to come off. The bottle was then removed, and the necessary adjustments having been made, weighed—after which, a portion of the water having been withdrawn, it was again placed under the receiver of the air-pump, etc. Temperature 60° F., the same, I may here remark—having omitted to do so on those occasions—as that observed in determining the specific gravity of the various specimens of graphite and apatite which formed the subject of some former reports.—Reports of Progress, 1876-77, p. 489 and 1877-78, p. 1 II.

II. DETERMINATION OF THE WATER.—The loss by dessication at 110° C. was estimated as hygroscopic water.

III. DETERMINATION OF THE SULPHUR.—This was effected by the method proposed by Mr. Nakamura.† The process is exceedingly simple and affords most accurate results. The details of the method, as given

* See under "Generalizations on the physical and chemical characters, and applications of these fuels." Pages 5 M-10 M.

† Journ. Chem. Soc., xxxv, 785.