paper on the Blow-pipe Assaying of Coals. The precise differences in the composition of coals have been too much neglected by geological observers; and a considerable amount of experience in assays and other examinations of this mineral, enables us to say that the methods recommended by Prof. Chapman will be found exceedingly valuable in circumstances in which trials on a larger scale cannot be made. We copy, for the benefit of students of this subject, Prof. Chapman's preliminary classification of the coals:—

"Without attending to minor distinctions or points of merely local value, we may arrange all varieties of coal, so far as regards practical purposes, under the following sub-divisions:

1. Anthracites.
2. Anthracitic or Dry Coals.
3. Caking or Fat Coals.
4. Cannel or Gas Coals.
5. Brown Coals or Lignites.

These varieties pass by almost insensible transitions into one another. Thus, the cannel coals are related to the lignites by the different kinds of jet, some of which are referable to the one, and some to the other sub-division. Between the caking and the cannel coals there are also various links; whilst the anthracite or dry coals, on the other hand—passing by excess of bitumen into the caking coals, and by a diminution of bituminous matter into the anthracites—serve to connect the first and third divisions. The typical or normal specimens of each of these five varieties, however, are sufficiently well marked.

1. *Anthracites.*—The true or normal anthracites possess a brilliant sub-metallic lustre, a degree of hardness varying from 3.0 to 3.25*, and a specific gravity of at least 1.33. A specimen from Pennsylvania gave 1.51; another specimen, 1.44; one from the department of the Isère in France, 1.56; and three from Wales yielded respectively 1.33, 1.37, 1.34. It should be stated, however, that many of the Welsh specimens belong strictly to the division of anthracitic coals, rather than to that of the true anthracites. The normal anthracites exhibit also a black or grayish-black streak; and all are good conductors of electricity. The

* Hausmann in his *Handbuch der Mineralogie*, gives 2.5 as the extreme hardness of all coals; but this is evidently erroneous, as many specimens, not only of anthracite, but of common and cannel coals, scratch calcareous spar.