

## Petrographic descriptions of specimens from the Stanhope coal mine

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Specimens from the Stanhope coal mine have been examined with the following results.

**1.** A soft, black, brittle, fine grained rock with innumerable white elongate spots. The spots are nearly all less than 1 mm long but in the larger ones sparkling cleavage faces are visible. On heating the rock becomes almost white by combustion of carbonaceous material.

In thin section the rock is opaque black, except for the white spots which consist of kaolin in curved and rectangular books of thin flakes showing a refractive index greater than that of balsam and low birefringence colours. Some hydromuscovite with higher birefringence is interleaved with the kaolin. Associated with the kaolin are anhedral remnants of oligoclase broken by networks of irregular cracks. Some pieces show cleavage.

When the carbonaceous matter is removed by heating the former black parts of the rock consist of angular fragments of oligoclase, very fine grained clay minerals, and sparse rounded grains of quartz.

**2.** This is a banded specimen consisting of:

(A) carbonaceous mudstone;

(B) intermediate band consisting of type (A) spotted with type (C); and

(C) limestone.

Band 2A is a fine grained black rock much the same as specimen 1. It becomes somewhat lighter in colour towards the underlying band. It consists of books of kaolin and angular fragments of feldspar and rare grains of quartz in a matrix of structureless fine grained clay and black carbonaceous material.

Band B is similar to band A but also contains irregular pale brownish masses of very fine grained carbonate.

Band C consists largely of interlocking crystals of calcite elongated in a vertical direction. Imperfectly horizontal and impersistent narrow bands of dark organic and argillaceous material containing crystalline kaolin intersect the carbonate.

Underlying band C, bands B and A are repeated in that order.

**3.** The hand specimen is a fine grained, bedded, black rock with a subconchoidal fracture and a resinous lustre on fracture faces. On heating the rock burns white without other apparent alteration.

In thin section the rocks show minute, angular, sparsely disseminated grains of quartz and feldspar in an irresolvable matrix of clayey and carbonaceous material showing aggregate polarisation.

The rock is a fine grained carbonaceous claystone.

**4.** The hand specimen is a central section of a small boulder. It consists of a grey rock made up of angular fragments of fine grained rock, euhedral crystals and angular fragments of feldspar and grains of quartz.

In thin section the rock consists of angular fragments of porphyrite, porphyritic latite, and feldspar crystals in a matrix of finely comminuted similar material and glass. The fragments are generally outlined by very fine grained white opaque material possibly produced by atmospheric weathering of ash during deposition.

The feldspars are in the oligoclase-andesine range.

The rock is a volcanic breccia.

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