

The specimen that helped physicians make the link between coal dust and lung disease

EUREKA MOMENTS

In 2014, Professor Ken Donaldson came to work at the Museum as a volunteer having specialised in lung disease and toxicology at the University of Edinburgh. He was key in helping the Museum develop its pathology exhibits for the Lister Project and was fascinated by our collection of respiratory specimens. Among these, he noted a particular specimen, GC.2100, which we believe is the first recorded example of coal-miner's lung disease. The specimen is described as:

"A lung (GC.2100) showing blackening of the lungs and disease caused by the constant inhalation of airborne dust whilst working in a coalmine."

In the 19th century, a burgeoning British coal-mining industry supplied fuel for the Industrial Revolution. By the 1830s, around 200,000 British miners were producing around 36 million tons of coal per year. It seems obvious now that inhalation of dust-laden air by colliers might result in harmful accumulation of dust in their lungs, but this was not initially apparent to physicians and surgeons. In fact, the first report of a link between working as a coal miner, the accumulation of a black pigment in the lungs and debilitating lung disease was not made until 1831. In that year, the physician James Craufurd Gregory received John Hogg, aged 59, into his care at Edinburgh Royal Infirmary. Hogg had worked as a miner in Dalkeith

REFERENCE

Case of peculiar black infiltration of the whole lungs, resembling melanosis. By James Craufurd Gregory, M D, FRSE, Fellow of the Royal College of Physicians, and one of the Physicians to the Royal Infirmary of Edinburgh. *Edinburgh Medical and Surgical Journal* 1831; 36; Art. XI: p389

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for the previous decade and was suffering from severe cardiopulmonary impairment.

When Hogg died three weeks later, Gregory carried out an autopsy and noted: “When cut into, both lungs presented one uniform black carbonaceous colour, pervading every part of their substance”. There was also a considerable degree of concurrent lung disease. Gregory speculated that the black pigment might be coal dust and handed the lungs to Sir Robert Christison, the Edinburgh physician/toxicologist famed for forensic investigation.

Christison analysed the black pigment extracted from the lungs and confirmed that it was coal dust. Gregory published his famous paper, the first to record that lung disease arose from employment in coal mines. In it, he suggested that the coal-mine dust “...remaining unabsorbed and acting

as a foreign body... led ultimately to disorganisation of the pulmonary tissue”.

In addition, he issued a perceptive public health warning to medical practitioners in coal-mining areas regarding “...a disease to which a numerous class of the community would appear to be peculiarly exposed”.

Although prescient in this regard, Gregory could scarcely have imagined the epidemic of lung disease that was to develop throughout the world due to coal mining. In 1840, Christison gave Hogg's lung to the College Museum, where this historic specimen is on display.

Ken Donaldson and Chris Henry
Surgeons' Hall Museums



The blackened lung of collier John Hogg, on which staff at the Museums believe the first published description of coalworker's pneumoconiosis was based