

**THE ORIGIN AND  
RATIONALE OF  
COLLIERY EXPLOSIONS**

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The Origin and Rationale of Colliery Explosions by Donald M. D. Stuart

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**DONALD M. D. STUART**

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BY THE SAME AUTHOR.

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THE ORIGIN AND RATIONALE  
OF  
COLLIERY EXPLOSIONS.

FOUNDED UPON  
AN EXAMINATION OF THE EXPLOSIONS AT THE  
TIMSBURY, ALBION, MALAGO VALE, AND LLANERCH COLLIERIES,  
AND UPON THE PRINCIPAL PHENOMENA OF THE  
DISASTERS AT THE

ABERCARNE, ALLTOFTS, ALTHAM, APEDALE, BLANTYRE, BRYN, CLIFTON  
HALL, DINAS, ELEMORE, HYDE, LLAN, MARDY, MORFA, MOSSFIELDS,  
NATIONAL, PENYGRAIG, RISCA, SEAHAM, TRIMDON GRANGE, TUDHOE,  
UDSTONE, AND WEST STANLEY COLLIERIES.

BY  
DONALD M. D. STUART, F.G.S.,  
MINING AND CIVIL ENGINEER;  
AUTHOR OF "COAL-DUST AN EXPLOSIVE AGENT."

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## P R E F A C E.

THE subject of Colliery Explosions again commands public attention, and proposals have been recently advanced, for strengthening the statutory regulations for the direction and discipline of Mines. The cause of these calamities has been sought with persistence and assiduity: and evidences have been accumulating for an examination of the respective theories of Fire-Damp and Coal-Dust, as the principal agents in Colliery Explosions.

The large explosions have been attributed to the presence of fire-damp, because that gas was known to be normally yielded in the mines; but this conclusion involved the hypothesis of sudden outbursts or accumulations of gas, of which there has rarely been any evidence beyond the fact that an explosion had occurred. The Coal-Dust theory was advanced to account for the disasters, but the absence of an explosion in non-gaseous mines up to 1893, presented a great difficulty to its acceptance, which was emphasized by the last Royal Commission upon Accidents in Mines in their well-known conclusion, that were coal-dust the principal agent in coal-mine explosions, these disasters would be of more than daily occurrence.

The subject received new point and direction in November, 1893, by an explosion at the non-gaseous mines at Camerton, in Somersetshire, which was proved to have been caused by the gases evolved from coal-dust; but it was the only disaster of this character that had occurred in non-gaseous mines, and therefore afforded an insufficient foundation for raising the question, as to what difference existed between explosions in gaseous and non-gaseous mines.

After a lapse of fifteen months, an important development of the question arose in a second explosion in a non-gaseous mine, at Timsbury,

in Somersetshire, and another opportunity was presented for investigating the phenomena of an explosion, not complicated by the presence of fire-damp. This second explosion provided the occasion for reviewing the facts observed, and the thoughts advanced in the Camerton Colliery disaster; and for preparing records of their fundamental features, so that a further effort may be made to elucidate their cause and rationale.

By the courtesy of Mr. F. R. Foot, the Agent and Manager, I was enabled to make several inspections of the Timsbury Collieries shortly after the explosion, and observed the close correspondence of its phenomena with those of the Camerton Colliery Explosion. Further investigation left no room to doubt, that the explanations I advanced of the Camerton Colliery Explosion were confirmed, and that records of the phenomena of the two disasters, would form an important body of evidence, for investigating colliery explosions generally.

After completing these evidences, I compared them with the records of the phenomena of explosions in gaseous mines, and found that there was an identity in their important features, which demanded for its explanation an identical explosive agent; and as the gases that caused the explosions in the non-gaseous mines proved upon investigation to have been derived from coal-dust, it appeared that the gases which caused the explosions in gaseous mines, must have had a similar origin. Upon subjecting this conclusion to fuller examination, it became obvious that fire-damp could not have been appreciably present in the numerous explosions, the records of which I had examined. Having arrived at conclusions of such importance to Colliery enterprise, I am venturing to offer a second work upon the subject of these mining calamities, for the purpose of making known the evidences upon which those conclusions have been reached.

The explosion at the Timsbury Colliery will be first investigated, and the correlation of its phenomena with that observed in the explosion at the Camerton Colliery, established. This body of evidence will then be employed as a foundation for examining the records of explosions in gaseous mines, and for considering the identities in the phenomena of the two classes of explosions.

PREFACE.

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I have much pleasure in expressing my obligations to the proprietors of the Timsbury Collieries, and to Messrs. Rees-Mogg and Davy, their Solicitors, for the loan of plans and sections of the Mine from which Plate I. has been prepared, and for other information upon the explosion which they placed at my disposal.

DONALD M. D. STUART.

BRISTOL,

*August 22nd, 1895.*

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