Coal Dust and Colliery Explosions.

So much has been written within the last twenty-five years on coal dust and colliery explosions that claimants for further honors in this field require to be very careful when stating the grounds for their appeal to fame, and they should not be surprised if they are required to submit their evidence to free criticism and to support it with an array of facts that are acceptable. At the same time if they frankly acknowledge the steps already taken by their predecessors in the inquiry and ask for no large amount of applause for having assimilated the information up to date, they may expect to meet with a more favorable hearing.

When, however, the claims largely partake of positive assertion on points previously suggested by others but held in abeyance pending more confirmatory evidence from observers of accepted caution, the claimants must expect some hesitation to be shown.

And in this class we would put Mr. Donald Stuart, F. G. S, who undertook to reply at the February meeting of the American Institute of Mining Engineers to certain comments made at a previous meeting on his work, "Coal Dust an Explosive Agent." In his reply to the comments of Dr. Day and others, he winds up by patting himself on the back, after the style of one of our native *precis* writers on the Reports of the Geological Survey of Canada, and he does it in this way—"In conclusion I venture to hope that the *rationale* of a colliery explosion, advanced in 'Coal Dust an Explosive Agent,' and developed in 'The Origin and Rationale of Colliery Explosions,' will help to give a grasp of the nature of the danger to be guarded against as will strengthen the hands of all *(sic)* engaged in colliery operations in contending with it, so that, in future, coal supplies may be obtained without the terrible sacrifice of life which explosives have entailed." Could modest omniscience ask for less?

And yet, having claimed something which he says he has discovered in connection with explosives, he fails to lay down rules for the guidance of coal miners that in *all* cases can be applied and will prevent disasters in future. It is unfortunate, however, that the "evidence" on which he relies does not carry conviction to *all* his readers. Take, for instance, the following:—Dr. Day remarked, "The only evidence of the absence of carbon dioxide (from the after-damp) is the fact that there was not enough to extinguish the lights of the exploring party, several hours after the explosion." Mr. Stuart replies, this is "a mis-apprehension. It will be found at page 62 of my book that four men in the new branch escaped and in doing so attempted *(sic)* to pass through over 150 yards of road in which explosions 8, 9 and 10 had occurred, and where the products of the explosions were imprisoned by the falls. They were in the stagnant atmosphere almost immediately after the disaster and their candles burned brightly in it." An *attempt* to enter after-damp is not evidence that had an entrance for some distance been made the gases would have supported life, and had Mr. Stuart had personal experience he would have known that fresh falls are seldom or never air-tight, a diffusion readily takes place through them, and this ahead of the detectable current of air.

That after-damp may be "suffocating, pungent and irritating" is not a new experience, and explorers after previous explosions have in some cases noted and recorded that their lamps would burn in an atmosphere largely composed of after-damp, so that in these respects Mr. Stuart has made no new discovery. Nor is he the first to offer a possible solution of lamps continuing to burn in an atmosphere containing after-damp. We spoke of this in our last issue in connection with a recent paper on the snbject from the pen of Professor Hall. In spite of his explanation we must continue to deem his evidence defective and to regard Dr. Day's remarks as more consistent with the chemical knowledge of today. Dr. Day said: "Mr. Stuart ventures the statement that carbon dioxide is an essential product of the explosion of hydro-carbon gases, although it is well known that these products may vary from water and carbon dioxide as products of complete combustion to mixtures in various proportions of hydrogen, solid hydro-carbon mixed with free carbon (soot), unburnt gaseous hydro-carbons, carbon in the form of coke, carbon monoxide, carbon dioxide, water, etc., according to the stage of incompleteness of the combustion." Mr. Stuart in reply gives what he calls evidence, but which is largely assumption on his part; witness the following:—"But if these proportions (for a complete combustion of hydro-carbon, gas and atmospheric oxygen) be departed from, then as their ratio from complete combustion disappears, the violent effects of the mixtures diminish until a point of incomplete combustion is reached in which no disruptive force is produced;" and elsewhere: "disruptive effects could only be produced by the explosion or practically complete combustion of the gas." In these comments Mr. Stuart shows a want of knowledge of the conclusive experiments by Dr. Thorpe and Mr. Shaw, who demonstrated to the one hundredth of a per cent. the point in a mixture of air and certain hydro-carbons when simple combustion ceased and explosion began. The lines are found to be sharp and distinct, though varying with the hydro-carbon used, but within the limits of explosion the percentage of hydro-carbon could vary some eight per cent.; and consequently the products of the explosions varied proportionately, though the violence of the explosion was immaterially changed.

Mr. Stuart claims to have proved by the explosions he discusses that coal dust alone is sufficient to occasion disasters, and that the Royal Commission erred in hesitating to accept this theory. That the cases he mentions are strong presumptive evidence must be admitted, but so were the practical experiments conducted by Inspector Hall—to which, by the way, Mr. Stuart makes no reference—and yet the Royal Commission thought it better to bring in a Scotch verdict of non-proven even with his evidence before them. In bringing before the public the details of the explosions at Camerton and Timsbury in Somersetshire, where the presence of inflammable gas is said never to have been detected by the safety lamp, Mr. Stuart has done good service, and the pains he has taken to collect data are worthy of all praise And further, as he has carefully kept separate his record of facts from his conclusions, any difference of opinion regarding the latter that may be held do not mar the former, and we therefore can confidently recommend his works to students of the subject.

Silver Mining in Kootenay, B.C.

Silver mining in British Columbia is practically confined to the Kootenay districts, and of these two great districts nearly the whole production so far has been from West Kootenay. From this district of West Kootenay there has been shipped during the past five years upwards of 20,000 tons of high grade silver ore, not including 3,200 tons of bullion produced by the Pilot Bay smelter during 1895, nor the shipments of this present year, which are largely on the increase owing to the operations of newly built concentrators and the Hall mines smelter.

The productive life of the Kootenay extends only over the past six years, and of this short time a great deal has been under great disadvantage for want of transporting facilities, and the ore might be left untouched to-day if it had not been rich enough to pay the expense of packing great distances over rough roads.

Railroads will come into a district after it has demonstrated by its shipments packed on animals' backs that the ore is there, and of a paying quality. Their extension has been rapid, but the needs of mining camps increase with equal or greater rapidity, with the result that many districts which will ultimately eclipse the present producers have to wait, since the ores, although of large body, will not pay for such costly transportation as is necessary, amounting in many places to from $10 to $50 per ton before reaching cars.

The two great districts of East and West Kootenay are further subdivided into recording divisions, each division having a more or less central point at which a Government office is established. Through