neglect is as undoubtedly the chief cause of the numerous failures which mark the history of the gold-fields.

CAUSES OF FAILURE.

Among the causes which may be considered as most prejudicial to the permanent and healthy progress of mining industry, the following may be mentioned:—They are not in any way especially characteristic of Nova Scotia, but prevail more or less in every mining region of which I have any knowledge, particularly in the early years of their development.

1st. The rash expenditure of capital in the purchase of mining-rights respecting the actual value of which nothing is known with certainty.

2nd. The hasty and inconsiderate erection of costly machinery for mining and treating the ores, before their quantity or their probable value has been determined.

3rd. The attempts frequently made to enhance the value of the stock by declaring dividends, sometimes paid out of capital, but often by means of a process commonly known as "picking the eyes out of the mine," or in other words selecting all the rich material to secure a few high yields which are far in excess of anything likely to be the future average.

4th. The too common, almost universal practice of devoting the whole of the net proceeds to the payment of dividends, and having no reserve fund to meet expenses when poor ground has to be worked through. This improvidence frequently necessitates the closing of a mine, and the abandonment of a property as worthless, which, under a more judicious system, would have become extremely valuable.

5th. The small size of the "areas" or claims, not as regards actual acreage, but in relation to the position and thickness of the veins. This necessitates a wasteful multiplication of shafts and plants of machinery for crushing and dressing the ores. In some districts in Nova Scotia these are out of all proportion to the actual requirements.

6th. The disregard of the natural features of the ground, shewn in locating the crushing and dressing machinery without reference to the easy delivery of the material from the mine and the fall required for the perfect treatment of the ores, and for getting rid of the tailings. This want of foresight necessitates subsequent heavy outlay for re-handling the material, all of which might be saved.

7th. The almost universal want of any appliances for saving pyrites and fine gold.

WASTE OF GOLD IN TAILINGS.

On this point Mr. Hind remarks in his recent Report on the Sherbrooke district:—"From careful assays of numerous parcels of tailings in Nova Scotia as they came from the mill, and selected indiscriminately, the average quantity contained was found to exceed 4 dwts. per ton. In many instances the assay gave a very much larger yield. These tailings lie around the mill in every direction, or are allowed to run into the nearest stream; in no instance known to me are they concentrated even to save the pyrites, or are any really valuable appliances used to save the free gold they contain, which has escaped from the stamping-boxes or the amalgamating-tables.

"A year ago, attention having been called to the escaped gold in the tailings of one of the mills at Waverley, portions were re-crushed and passed over amalgamating-tables; and in the official return for 1869, we find the following statements: 288 tons of waste from the dump, gave 32 oz. 5 dwts. 11 grs.; 63 tons of waste from the dump, gave 13 oz. 12 dwts. 16 grs. From this experiment some idea may be formed of the amount of gold allowed to escape in the tailings from upwards of 190,000 tons of quartz, the quantity already crushed in Nova Scotia."

HUNT, ASSAY OF TAILINGS.

As indicating further the probable value of some of these heaps of tailings the following analyses by Dr. Hunt, are here given of three samples which I collected from Yarmouth, Montague and Renfrew respectively. He says, "the proportion of arsenical pyrites or mispickel (other sulphurets being rare), was determined by dissolving it out from the quartz; and the following figures give under A, the amount of gold per ton of tailings; under B, the amount of gold per ton of pyrites; and under C, the proportion of pyrites in the tailings: The determinations under A and B, were made by the ordinary fire-assay upon the roasted tailings."

	A	B	C
Montague	5½ oz.	12 4-20 oz.	43 per cent.
Renfrew	2½	4	64 "
Yarmouth	5½	7 15-20	65 "

The sample from Montague was taken at about eighty feet from the last amalgamating-plate, and at about seven or eight inches below the surface of the heap.

The sample from Renfrew was taken from six inches below the surface of the heap, and at about ten or fifteen yards from the last amalgamating-plate.

The sample from Yarmouth was given to me by the owner of the mill; I have no knowledge of the circumstances under which it was collected.

A sample of tailings from Moosecland, taken from the fourth mercury-trap, Dr. Hunt found to contain 58 per cent. of arsenical pyrites. A portion concentrated to 88 per cent., gave one and one-half ounces of gold to the ton: equal to 1 oz. 14 dwts. to the ton of pure pyrites.

In digging into the surface of the heaps of tailings, I noticed that the pyrites was not equally distributed through the mass, but almost always in layers, giving a regularly stratified appearance to a vertical section of the sand; the pyritous layers being from one-eighth to one inch in thickness, and the more sandy layers considerably thicker. The samples were taken rather to show the value of the pyrites, than the quantity of pyrites or gold in the tailings; and therefore the figures under A and C are not a correct average of the heaps; but even supposing the tailings to contain no more than one-half the above amounts, the value of the gold which is being annually lost is enormous, and the subject is well worthy the serious consideration of every mine owner in the country. This fact of the richness in gold of the arsenical pyrites of the lodes in Nova Scotia is not new.