

cially obtained, and it went to waste with the tailings, and was lost. That a large amount of gold which otherwise would have gone to waste has been recovered by means of the plaintiffs' patent, in conjunction with another patent, which they took out prior to the filing of their complete specification herein, when applied at any rate to the tailings of South African ore, has been clearly established, and, indeed, there is no evidence to the contrary. The object which the plaintiffs had in view, and which they attain by their two patents, was by the first to extract the gold from the crushed ore by getting the gold into a state of solution by means of the application of a solution of cyanide of potassium, and then by their second, which was for an improvement in precipitation of gold by zinc, which was then well known, to extract the gold theretofore brought into a solution out of it.

It is well known that ore which contains gold also contains baser metals, such, for instance, as copper-ores, lead, and other metals, and the problem which had to be solved was how to extract gold out of the crushed ore, and get it into a state of solution without at the same time getting into that solution the other baser metals; or, in other words, how to extract gold from its ores and get it into a state of solution commercially free of the baser metals.

That the plaintiffs solved this problem appears to us upon the undisputed facts of this case established, for it is proved that by their application of a very dilute solution containing an extremely small quantity of cyanide of potassium to the tailings of South African ore they have profitably extracted gold therefrom in a commercially pure state, even though the ore contains only such extremely small quantities as two or three pennyweights of gold in a ton weight of ore. Professor Austen, of the Mint, stated, in the year 1893, some 500,000oz. of gold were produced by the cyanide process and came to this country, a large proportion of which, but for the plaintiffs' process, would have been wasted and unproduced, and this represents a very large sum in pounds sterling.

Evidence was unhesitatingly given by, amongst others, Professor Dewar, Professor Austen, and Professor Crookes that a dilute solution of cyanide of potassium has been found to have the properties which the plaintiffs claimed for it—that is, of having a selective action so as to dissolve the gold in preference to the baser metals—and that this was not known before. The evidence upon the other side as to this was feeble in the extreme. No evidence was given as to how it was that the plaintiffs brought out the results, which they unquestionably did, if they did not bring them about in the manner they claimed. A suggestion was made at the Bar that South African tailings were such that the gold therein could be easily extracted therefrom without the cyanide having the properties claimed for it, and it does appear in the evidence that some ores are more refractory than others. Mr. Harland, on behalf of the defendants, stated that, in the experiments which he had made, he found that the base metals—the iron, the copper, and other metals, as the case might be—went into solution along with the gold, and that he had always found in his experiments that, “in a short time or a long time with a high solution or a weak solution,” he got out both the base metal and the gold together. We would point out that, though this was the result of Mr. Harland's experiments, it still remains to be answered, how did the plaintiffs bring about those results which they undoubtedly have? To this we can find no answer in the defendants' case.

The defendants sought to explain this paucity of evidence which they brought on their part, as to the selective action of small quantities of cyanide of potassium, by asserting that they had been misled into the idea that Sir Richard Webster had abandoned his claim to the selective action, and they pointed to an answer he gave to my brother Romer towards the end of his reply, but, when the whole course of the trial is looked at, we have no manner of doubt that Sir Richard never gave up the point at all, and he has fully explained how it was that he came to give the answer he did, and that it had no reference whatever to his abandonment of this claim. We must add that, even assuming the defendants thought, when he gave the answer which he did, that he had abandoned his claim to the selective action, that would not account for the meagre evidence which they gave upon this point, for Sir Richard Webster's answer was not given until the whole of the evidence had been closed, and, indeed, not until he had come to almost his last words in his reply upon a six days' trial.

The selective action claimed by the plaintiffs for the application of a very dilute solution containing an extremely small quantity of cyanide of potassium to ore containing gold has, in our judgment, been proved.

But, it is said, even if so, yet there was no novelty in what the plaintiffs have claimed by reason of the information which had been set forth in prior publications. To show that this was so a series of published documents was put in evidence by the defendants, commencing with the specification of Elkington in 1840, and ending with a specification of James Hannay in 1887. They were in all twenty-four in number, and amongst them were contained five specifications—namely, Elkington's in 1840, Rae's in 1867, Sander's in 1881, Simpson's in 1885, and Hannay's in July, 1887. It is not suggested that, under any one of these specifications, gold has in fact been commercially extracted from its ore, but it is said that these specifications (apart from the question of anticipation, which we will deal with hereafter), together with the other documents put in by the defendants, show such a state of general chemical knowledge of the fact that cyanide of potassium would dissolve and thus extract gold from its ore as it is in nature that no novelty exists in the plaintiffs' invention. We do not propose to go through this list of publications, for it is sufficient to take those which the defendants' witnesses point to as being the best for elucidating that for which they were put in, namely—Faraday's papers in 1857, Rae's specification in 1860, Dixon's paper in 1878, and Simpson's specification in 1885.

As regards Faraday's paper, it deals only with gold in its pure state in the form of a very thin leaf or film; it in no way deals with gold as found in nature, in ore, combined with the other baser metals which are its associates. Faraday knew what many since, if not before, have known, that cyanide of potassium was to some degree a solvent of gold, but he in no way foreshadows its applicability or utility to the extracting of gold from the other baser metals as it exists in the earth.