As regards Rae's American patent, which was for treating auriferous and argentiferous ores, he declares that his invention consists in treating these ores with a current of electricity for the purpose of separating the precious metals from the gangue. It is true that he uses chemical preparations, such, for instance, as cyanide of potassium, in connection with the electric current in such a manner as that by the combined action of the electricity and of the chemicals the gold contained in the ore is first reduced to a state of solution. He describes how he pours his chemicals upon the rock—*i.e.*, ore—and then applies his electric current. It appears to us, so far as this specification is concerned, that Rae might just as well have used *aqua regia*, or any other known solvent of gold in connection with his current of electricity, and brought about his desired result, which, however, as a fact, he never attained. Professor Crookes, under cross-examination, stated the reason why he thought Rae added his electricity was because he had got an imperfect solvent action, and he consequently added electricity. Sir Edward Clarke argued that the first process as regards the solvent was sufficient without the electricity. But where is the evidence of this? On the contrary, in our judgment, it is established in this case that unless the solvent—*i.e.*, the cyanide of potassium—is used in the extremely small quantities in solution as discovered by the plaintiff (and in Rae's patent it is unlimited) it is simply useless; for, as Professor Crookes and others pointed out, a strong solution attacks the baser metals without attacking the gold, whereas a weak solution is feeble and nil on the baser metals, but attacks the gold.

We now come to Dixon's paper, which was read before the Royal Society of New South Wales in August, 1877. It was a paper as to the method of extracting gold, silver, and other metals from pyrites. It first deals with that which was, and is, common knowledge—namely, that precipitated gold is soluable in cyanide of potassium if exposed to the air; and, after alluding to Rae's American patent and other matters, he makes the most significant statement. He says, "There being, therefore, no method by which the precious metals could be removed, and the baser metals left, it remained to fall back on one of the first principles of metallurgy—namely, to remove the baser metals at the earliest stage, if possible, and leave the precious metals as a residue." Now, this is exactly what the plaintiffs by their invention have shown should not be done, for they remove the precious metals by their invention at the earliest stage, and leave the baser metals as a residue; and yet the defendants' witness, Mr. Vautin, as also Mr. Mactear, cite Dixon's paper as possibly the best publication they have to show what they want to establish as regards prior general knowledge. In our opinion, this paper of Dixon's is cogent evidence in favour of the plaintiffs, and equally so against the defendants.

Now, as to Simpson's American patent of 1885, which was published in this country prior to the plaintiffs filing their provisional specification. In our opinion, of all the documents put in, when understood, this is the only one which even approaches the point which the defendants put them in to establish. It is a chemical patent for improvements in the processes of extracting gold, silver, and copper from their ores. From it, as in the other specifications, no results were ever obtained, but nevertheless it is necessary to see what information it imparts to the chemical world. By his specification Simpson first of all crushes the ore. This is common to all extractions of gold. He then mixes the crushed ore with his solution in a tub or bath, and he then allows the mixture to stand until the solid matter is settled and the solution is clear. He then precipitates the metal—that is, the gold which is in the solution—on to zinc. The solution which he uses for either gold or copper is made of cyanide of potassium and carbonate of ammonia—namely, 1lb. of cyanide of potassium and 1oz. of carbonate of ammonia. He says (we assume pointing to Rae's patent) that he is aware that cyanide of potassium, when used with an electric current, has been used for dissolving metal, and also zinc has been employed, and the use of these he did not wish to be understood as claiming broadly. He also was aware that carbonate of ammonia had been employed for dissolving such metals as are soluble in a solution thereof, and the use of these he did not claim. "What I claim," he said, "as new is the process of separating gold and silver from their ores, which consists in subjecting the ore to the action of a solution of cyanide of potassium and carbonate of ammonia, and subsequently precipitating the dissolved metal substantially as set forth." The question is, does this specification add to the stock of common knowledge, so as to inform men skilled in chemistry that by the application of a very dilute solution of an extremely small quantity of cyanide of potassium alone to gold as it exists in ore in nature when the ore is crushed the gold can be extracted therefrom, leaving behind the baser metals? It is true that Simpson's 1lb. of cyanide of potassium is about equivalent to the margin of half to two of cyanide of potassium in the plaintiffs' specification. It appears to us, as laymen, that the compound composed of a combination of the two chemicals—namely, cyanide of potassium and carbonate of ammonia—in the proportions mentioned is not only what Simpson was relying upon, but what is the natural meaning of his discovery as described, and it would not lead any one to suppose that a very dilute solution of an extremely small quantity of cyanide of potassium alone would do what it was supposed the compound of the two would do, and which so many desired to attain.

But this part of the case does not rest here, for a body of scientific evidence was called as to this. On the plaintiffs side many witnesses stated emphatically that Simpson's specification would not have led a chemist in 1887 to the knowledge that a solution of cyanide of potassium would act by itself as a solvent of gold in ore, and they gave *in extenso* their reasons for this conclusion. Professor Dewar stated that if he had read Simpson's patent at its date he should have understood that he had discovered the carbonate of ammonia, possibly to replace the electric current; and Professor Austen said the same. On the other side witnesses, and especially Mr. Vautin, were also explicit that specification would afford the information.

When this evidence is weighed we have no doubt that that given on behalf of the plaintiffs largely preponderates; but there is another fact which seems to us important, and it is this: If Simpson's patent of 1885 informed the chemical world that a small quantity of cyanide of potassium in solution would extract gold from its ore it is strange that no witness (and we cannot find one)