

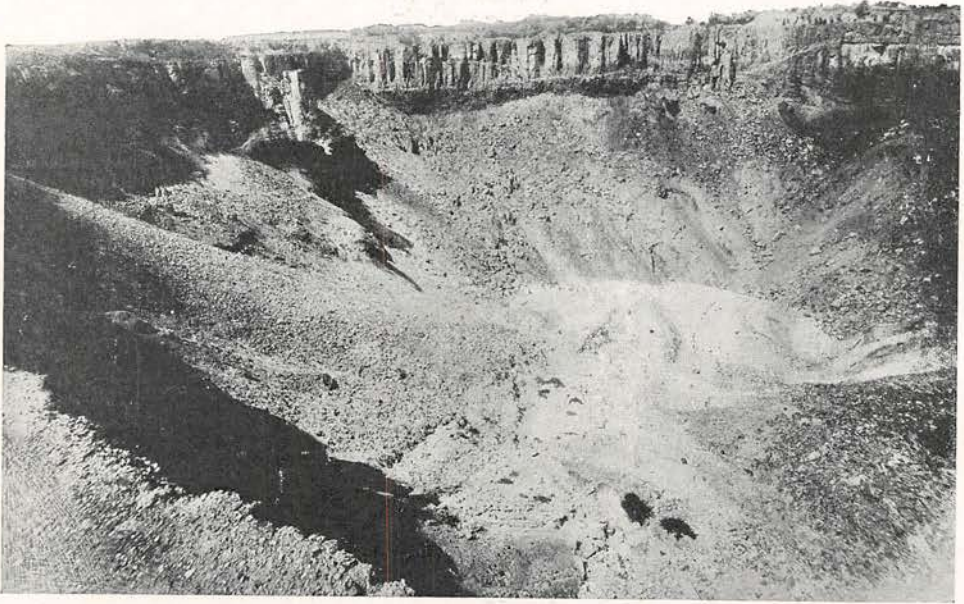
THE INDUSTRIAL REAWAKENING OF SOUTH AFRICA.

BY NEVILLE EDWARDS.

Illustrated from Photographs by the Author.

NOW that South Africa is at last awakened from the hideous nightmare of war, in which she has lain prostrate for nearly three years, she is once again attracting the attention of the world to her wondrous stores of jewels and gold. As everyone is aware, nowhere else on the face of the earth are there such wonderful diamond-mines as those at Kimberley, or such treasures

For Kimberley is the veritable home of the diamond. It is true that these extraordinarily prized bits of stone, for which men and women will sell their souls and bodies, are found in other places as well; but they are mere homeless vagrants, so to speak, lying scattered about in the earth as if dropped there by chance, with nothing in the nature of a mine to indicate their origin.



THE GREAT HOLE OF THE DE BEERS DIAMOND-MINE, KIMBERLEY, AS IT IS TO-DAY.

of gold as in the country of our late enemies, over which the British Flag now proudly waves.

The diamond-fields being older, as well as on account of their absolutely unique character, claim attention first.

Kimberley, "where the diamonds come from," is a place which always possesses more than ordinary interest. Its long-protracted siege and gallant relief turned the eyes of the whole world to that dusty, mean-looking corner of the British Empire, a spot which is nevertheless its chief jewel-shop, from which over £4,000,000 worth of gems find their way every year.

But at Kimberley it is a different case altogether. It is as if the coiner of these valuable brilliants had been here tracked to his lair. When you enter the great mines there, you feel that you are in one of Nature's laboratories, where, in the beginning of time, the mighty Alchemist, in moments of relaxation from bringing down and lifting up continents, produced these glittering playthings.

What is a diamond? Scientists will tell you that if you subject one to an intense heat, your priceless stone will be resolved into nothing but a black lump of pure charcoal.



Photo by]

[J. Trim, Kimberley.

KIMBERLEY MINE, SHOWING OPEN WORKING AND WIRES IN 1874.

But alas! these scientists fail to explain, what each one of us would like to know for his own exclusive use, how to make a satisfactory diamond out of a bit of charcoal. As a matter of fact, indeed, one or two men actually have succeeded in producing diamonds out of it, but a gem only the size of a pin's head is the usual result. The method, however, by which they achieved this forms a probable clue to the way Nature created hers at Kimberley. Man's way has

been to immerse particles of charcoal into molten iron brought to a tremendous heat, and then, by suddenly cooling the mass, to produce, by its shrinking, an enormous pressure such as no other means could give. Then, on breaking open the iron, the tiny gems are found within.

In the bowels of the earth we know there is intense heat, we know there was the pressure caused by shrinkage, and, we believe, hence the diamonds. Only old



Photo by]

[J. Trim, Kimberley.

THE SURFACE WORKS OF THE KIMBERLEY MINE IN 1874, SHOWING HORSE-WHINS USED FOR HAULING THE ORE UP THE WIRES.

Dame Nature has got the secret in that witch's hat of hers of making them a decent size.

At Kimberley there is special justification for this theory of how the diamonds came there. For there can be little doubt that what we to-day know as diamond mines our prehistoric ancestors knew as volcanoes. Though the country now lies so flat that, as Commandant Cronje put it, "there's no hill between Kimberley and Bloemfontein higher than an ant-heap," yet it is pretty evident that these mines, which are great

covered at a time when things were as bad as they well could be. "It is always a feast or a fast in South Africa," is a well-known Colonial saying; and truly when things are bad there, they are very bad. Certainly nothing could have been much worse than the position of things in 1867. Merchants were failing all over the country, credit was exhausted, and agriculture at its last gasp. Then, like a happy waking from an evil dream, came the news that diamonds had been discovered. "*Ex Africa semper aliquid novi*" is a saying dating from the days of



IN A JOHANNESBURG GOLD-MINE, EIGHT HUNDRED FEET BELOW SURFACE.

circular pipes going straight down into the bowels of the earth, were once high, active craters filled with molten lava. It is in this "blue ground," as it is called, which is very similar in appearance to the lava which ran from Mont Pélee, that the diamonds are found.

When the mines were first discovered, no one dreamed of the illimitable depth to which these craters seem to go. In fact, South Africa found it hard to realise the good fortune which had been suddenly flung at her feet. For the diamond-fields were dis-

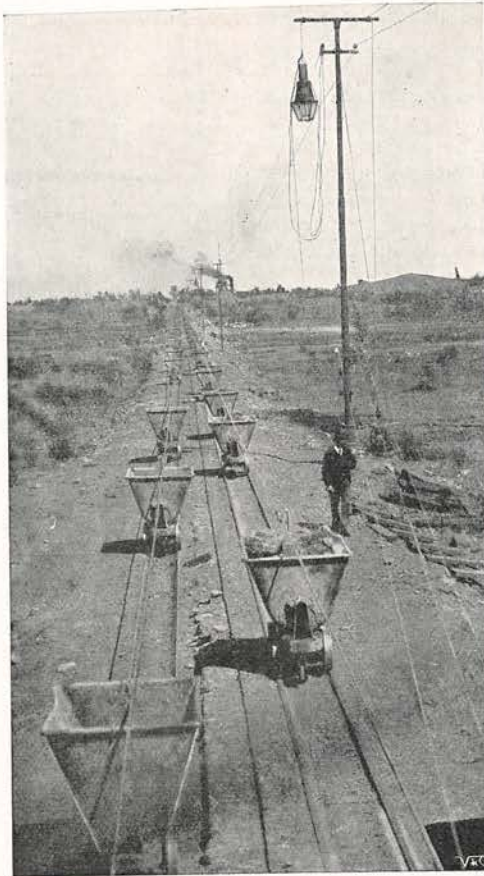
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Pliny, and "Out of Africa always something new" it was felt to be indeed, when diamonds were found in such an unlikely, outlandish spot as that where Kimberley now stands. For the district is such an "abomination of desolation." A raw, red country of blank, barren earth, with nothing on its surface but tiny, withered-looking sage bushes at wide intervals, like the tufts of wool on a Hottentot's head. A land where it takes three acres to keep a sheep, and then the animal gets more exercise than food.

There was no railway to the north in those days. What earthly use was it to run a line into such an utterly barren and unpromising waste, with no inhabitants but a few half-starved Boer farmers and traders at long distances apart, and a few wretched Griquas and Bushmen living on snails and locusts? Yet, out of this desert, as it then was, came one day the news that a trader named John O'Reilly had got what looked to be "very like a diamond," from a little Griqua boy whom he had seen playing with it under the blazing sun. So little was known of diamonds in those days that O'Reilly had to wander round for a long time before he could find anyone scientific enough to certify as to the nature of his find.

If this news created interest, what must

of the first water which he had bought from a Hottentot for £400? This diamond was the famous "Star of South Africa," now in the possession of the Countess of Dudley,



ENDLESS HAULAGE, KIMBERLEY DIAMOND-MINE.



THE GREAT HARD ROCK SHAFT-HEAD AT DE BEERS DIAMOND-MINES.

and said to be worth £25,000. These stones, however, were found a considerable distance south of Kimberley, in a district where nothing much has come to light since. It was not till 1870, or three years after John O'Reilly found the little Griqua boy "playing chuck-farthing with the destinies of South Africa," as it has been termed, that the first of the great mines was discovered in the neighbourhood where Kimberley now stands.

The rush to the Arctic horrors of the Klondyke at the magic cry of gold is so fresh in one's recollections that it is not difficult to imagine what followed. Men will sell their souls for gold, but even nugget-hunting is tame to the excitement of feeling, when sorting through ground, that at any moment you may come across a large fortune in one pebble. So up the

have been the wild excitement when, not long after, another trader, named Van Niekerk, brought down and sold in Cape Town for £10,000 a most magnificent stone

fortune-hunters came—in ox-wagons, in mule-carts, on horses, and on foot, people of every nation under the sun—men, women, and even children braving the terrors of the long six weeks' trek over the sun-baked, waterless Karoo in the mad struggle for that will-o'-th'-wisp wealth. A town of tents and galvanised iron shanties was quickly formed, which looked then—as, for that matter, it does to-day—as if it had been shaken down out of a pepper-pot among the heaps of mine *débris*.

Everyone turned digger, and the quantities of stuff taken out of the ground were so colossal that the holes thus formed grew to extraordinary proportions. Indeed, they now constitute one of the seven wonders of the modern world. Their size is positively awe-inspiring. Some idea of their vastness may be conveyed to the reader when it is mentioned that all the Pyramids of Egypt and the cathedrals of Europe could be placed in any one of them. Yet the topmost pinnacle would scarcely come level with the surface, for they are over 500 feet deep. Their sides are perfect precipices, and, though working in these great holes has been discontinued for years, you may even now be startled by the avalanches which come thundering down into their abysses from the sides. The photograph on page 420 shows one of these great holes as they are to be seen to-day, empty and desolate, for all the working now takes place underneath, the great cavity at the top being as nothing in depth to what has been attained below.

In the old days of open working the scene the mines presented was most extraordinary, as will be seen on reference to our illustration on page 421. This vast amphitheatre of between thirty and forty acres was spread over with a network of thousands of wires like a gigantic spider's web. Every claim-owner had a wire, and the number of them was consequently so great as almost to darken the work below. Here the natives swarmed like ants over the ground in the work of extracting the ore, which was hauled to the surface in buckets running on the wires by horse-whins.

All this is changed now. All the wires, all the stirring life have vanished. In place of the picturesque, happy-go-lucky diggers, with their wives and children sorting through gravel under huge sunshades, there is the one great corporation, the De Beers Consolidated Mines, owning all the mines, and turning out diamonds with no more excitement or enthusiasm over the process

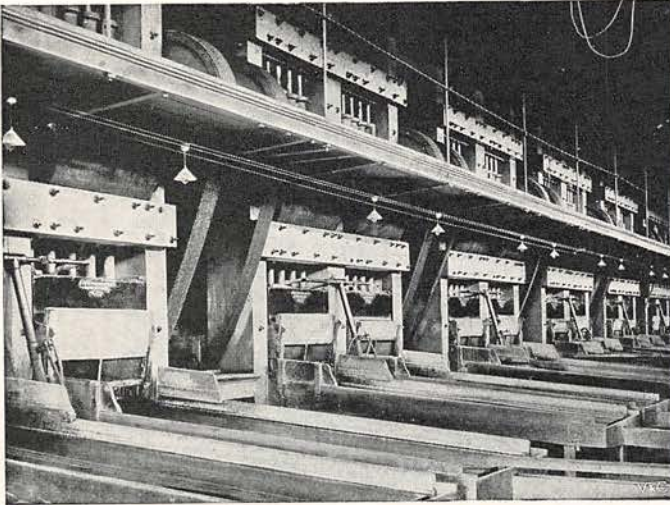
than if its products were coal or candles. They are the mighty masters who own everything, by the light of whose countenance the town of Kimberley, in a sobered, bereaved way—for its life has gone with the diggers—continues to exist.

"How was it," I once asked one of these old-time miners, "that you all parted with your claims and let Cecil Rhodes buy you out, when you might have gone on getting out diamonds for yourselves?"

"Ah! Rhodes is a great man and a cute man," he replied, "but even he could not have got all the mines into one control if other causes had not come to his assistance. It was like this, you see. At first it was delightful—we dug away and got out our diamonds without any trouble. But after a time, when claims got deeper, water began to come in; then the waste rock from the sides commenced to fall and smothered out our claims faster than we could clear them. So it gradually became evident that we had got beyond our depth in more senses than one. Only a big company with millions to spend in starting afresh to mine underneath the open workings could ever hope to do any good. So we had to give in. Then, again, we had no means of stopping the thefts by our Kaffirs, and we undersold each other with what stones we did get. Ah, yes! I suppose it was bound to come, but many of us lost our all," he sadly concluded.

To visit the mines now, a permit has to be obtained from the all-powerful De Beers Company before you can enter their sacred precincts. Once inside, however, it is really wonderful how you are allowed to roam about unattended, as if nothing more valuable than paving-stones were being got out of the earth. The "Hard Rock Shaft," a photograph of which is on page 423, whose lofty, Eiffel Tower-like spire is such a prominent feature of Kimberley, is about the first object the visitor notes on entering. It will be remembered that it was used by the garrison for searchlight communications with the relieving force. Here, night and day, at the speed of express trains, the trucks come whizzing up from the various levels, 1,000 to 1,500 feet below, and empty themselves into an ore-bin, which automatically reloads other trucks.

Then comes a wonderful automatic triumph. The trucks pass under an endless, ever-running wire rope (see page 423) and instantly, as if moved by a spirit hand, start off on a long journey to the "floors," where the ore is deposited. The "floors," it should be ex-



INTERIOR OF BATTERY, CROWN REEF GOLD-MINING COMPANY, JOHANNESBURG.

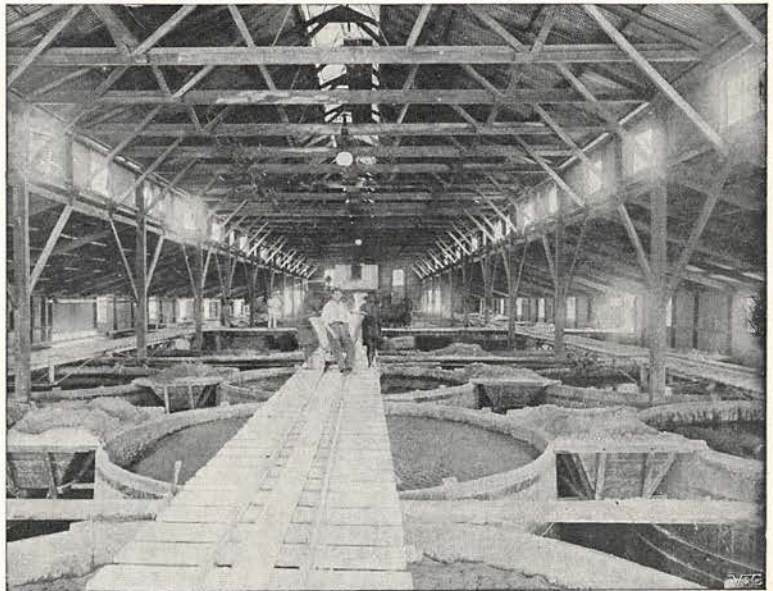
this day. Over miles of ground the ore is spread and allowed to lie for about six months before it is taken up for further treatment.

To cover these miles there is a perfect network of railways within the mine grounds. Of the "light" order, it is true, but with real engines and cars running on them. Some of the engines are very tiny—not much larger, indeed, than a good big dog, and consequently not always strong enough for the work in hand. This was proved to me on one occasion in rather an amusing way. I hailed one of these passing trains, which pulled up, and I got on board. Excepting

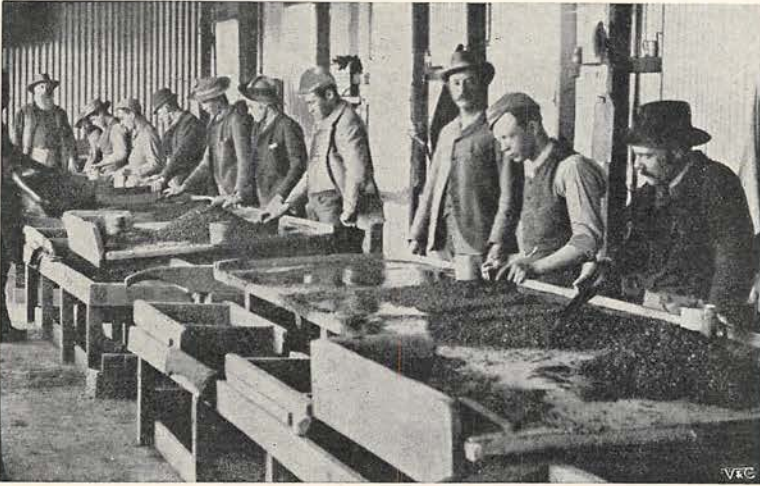
plained, are just large, fenced-in spaces where the hard ore is allowed to lie in order to get soft.

When the diamond-fields were first discovered, this hardness of the ore was one of the principal troubles. No one knew how to treat it satisfactorily. To crush the stuff was to run the risk of also crushing to atoms some splendid large diamond, while to pass huge lumps would be to miss unnumbered finds. There was an old Boer, however, who was noticed never to have any trouble. What did he do? He was carefully watched, to discover his wonderful secret for making the ore soft. But no one could find out what he did to it. And no wonder; for he did—nothing. He just kept it by him and left all to Nature. The rain and the sun and the air played upon it, and behold, his hard rock crumbled into soft mud and gravel! That is the system of treatment followed to

for a long comet's tail of trucks behind us, the driver and I had it all to ourselves. After a time we came to a high bank. The engine panted and strained till one feared it would have apoplexy. We got red in the face in sympathy with the poor thing, but all to no purpose. We began to stop. "Oi reckon we maun git aht and give her a shoov," said the Cornish driver. One has so often heard sarcastically irate passen-



CYANIDE PROCESS GOLD EXTRACTION VATS, NEW PRIMROSE GOLD-MINING COMPANY, JOHANNESBURG.



DIAMOND SORTING.

gers on delayed trains at Bank Holiday times in England call out to guards asking if they should get out and push, that it struck me as irresistibly comical actually to do it. But though we "shoved" with all our might—the Cornishman, myself, and the engine—our united efforts were unavailing. It was not till we had executed an elaborate scheme of parting with half our trucks, taking the other half over our *Pons Asinorum*, shunting them into a siding, and then returning for those left behind, that we were able to continue our journey out to where the gigantic washing machines were at work separating the *débris* from the pebbles.

For, it is hardly necessary to point out, there is a good deal else besides diamonds that comes out of the mines. In fact, if one diamond is in a barrowful of ore, the Company feels that its average is well kept up. Consequently, to get rid of the *débris* in a cheap and satisfactory way is of the highest importance. The method by which this is achieved at Kimberley is as simple as it is clever. If you were to pour into a wash-basin a steady stream of mud, gravel, and water, while at the same time you kept on stirring the mixture round and round, it is obvious that the mud and water would overflow, and only the pebbles, being heavier, would be left. This is exactly the principle of the diamond-washing machines, one of which gigantic erections is shown in the photograph on page 428. Having once got the pebbles alone, of course it is simple enough to sort them through for the diamonds.

This is the really fascinating part of the

whole business. Up to this point you may have wandered round this Arabian Night's treasure-field and yet never seen a sign of a gem. But at the sorting tables it is quite exciting. Sweep goes the gravel in front of the operator, and while you are thinking: "I wonder if that's a diamond," his lightning eye and unerring hand have spotted it and dropped it into a salt-cellar. You

realise that if "all that glitters is not gold," many stones that do not glitter may be diamonds. Numbers of queer-looking, discoloured pebbles, that you would have passed, are seized by the experienced operator, who knows that diamonds, like men, cannot always be judged by a rough exterior.

The pebbles are again re-sorted by gangs of Kaffirs. These are under the supervision of lynx-eyed overseers, as the Kaffir, "for ways that are dark and for tricks that are vain," is almost as peculiar as the Heathen Chinese. The mining native is a simple-minded beggar, but withal possessing a considerable faculty of taking care of number one. He was not long in discovering the value of these shiny stones, and was a willing co-operator in the wicked white's wily ways of getting them. "Me steal fine diamond, me get p'raps hundred pounds. Hundred pounds buy me eight, p'raps dozen wives. Dozen wives, good bizness. They till mealie patch, me smoke pipe all day, me look on. Me no more work." Here was a philosophy and a vista of the perfect life for the black man, and all to be had for the concealing of a diamond or two. But, like so many other things good in moderation, the Kaffir overdid the business. The claim-owners kicked when they found that he secretly sold for himself far more diamonds than he found for them.

It was this more than anything else which paved the way for the system introduced by the De Beers Company of making all the natives in their employ live as prisoners in compounds. Here, though deprived of some of the wild joys of dishonesty, the native

does not have a bad time of it on the whole. If a prisoner, he is a well-paid one. He gets about £4 a month and his "skoff," as he calls his mealie-meal porridge, with the right of buying everything in the compound stores at almost cost price. Wood and water are given to him free, and the hospital is always open to him in case of accident or sickness. There is no Mrs. Grundy to dictate how much or how little clothing he shall wear.

The Company, as will be gathered, are unsympathetic towards his aspirations to the life of earthly bliss we have described. Even the darky's laudable desire to communicate with his "brothers" outside the compound is checked. This used to take the form of throwing over the wall tins of condensed milk, in which diamonds had been placed as keepsakes, but it was stopped by his unfeeling masters placing netting overhead. If the native goes to the trouble and inconvenience of making holes in his own flesh with a penknife and planting diamonds therein "to see if they will grow," his masters will not even let him have them as the reward which should be due to experiment. But at the same time they are careful of his well-being :

for a week before he leaves he is generously dosed with medicines to prevent him getting indigestion from any gems he may have swallowed.

Still, with all their efforts, the Company do not have things all their own way. The pastime of I.D.B. (illicit diamond buying) still goes merrily on—this notwithstanding that the forfeits in the game are usually "seven years' hard" on the breakwater at Cape Town to anyone unlucky enough to be caught in possession of an uncut diamond without the written permission of the Kimberley police. It is believed that nearly one-fourth of the total output is thus misappropriated. Certainly, if you go to the diamond-room at the De Beers offices in Kimberley, the finest stones they show you are those stolen by their own *employés*. These are actually bought back by them through secret channels. This is done in order to prevent the diamonds getting on to the European market, which would effectually ruin the Company's power of keeping up prices.

The diamond-room at the De Beers offices is quite small, yet it easily holds all the products of the vast mines, with their intricate



ORE SORTING ROOM, NEW PRIMROSE GOLD-MINE, JOHANNESBURG.

machinery and thousands of workers. Indeed, you can hardly help laughing at the ludicrousness of the contrast between the mountains outside and the molehills within. "Diamonds, indeed! Why, surely those little heaps on white pieces of paper are samples of soda or sugar—anything you like, but not diamonds!" Yes, it is hard to realise that those rough, dull pebbles will one day add lustre to beauty's crown at stately dance or royal reception; that all fashionable womanhood to the farthest limits of the earth is hungering for the possession of those bits of pebbles in this out-of-the-way spot.

The gold-mining district of Johannesburg is in many ways quite as astonishing as the place whence the world's diamonds emanate.

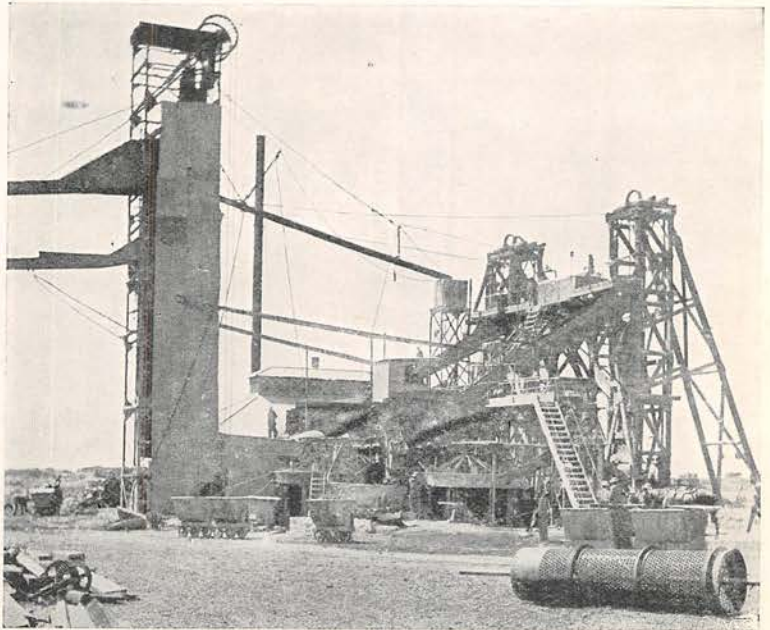
No one who has travelled there by that long train journey of over a thousand miles from Cape Town, through the desolate red Karoo and the interminable prairie stretches of empty grass veldt in the Orange River Colony and the Transvaal, can ever forget his first sight of the great Main Reef. During the long journey it almost seems at times as if leave had been taken of the world altogether and a change made to a desolate planet. Then this scene of almost unparalleled human activity bursts upon you. Far as the eye can see on either hand, shaft-head, mill, and towering chimney succeed each other in an almost unbroken line. Where once cannon thundered and rifles rattled their death-dealing notes, the old, sonorous sound of the mills has resumed its sway. Pervading all, like the voice of the ocean, they call to one another as deep calleth to deep.

Here, day and night for ever, the mighty stamps, silent and rusting so long, are once again singing their hymn of work as they unceasingly pound up the gold-bearing ore.

All the way, as the train turns to the left

at Elandsfontein Junction and heads for Johannesburg, the same roar and the same scenes greet ear and eye. Of Johannesburg, which lives by this golden Diana, that wonderful mushroom city which sprang up at the cry of "GOLD," it is not necessary for me to speak here. Its marvellous skyscraping buildings, its telephones, its electric lights, its activity, its wealth, and all the other marks of its astonishing civilisation, have been described so often. To the thoughtful man, however, interest centres in the mines, the cause, rather than in Johannesburg, the effect.

And the mines are indeed wonderful. When the reef was first discovered and proclaimed as a gold-field in 1886, even the most sanguine of all the thousands of prospectors and others who madly rushed to peg out claims little dreamed of what really vast resources of gold lay beneath his feet. The ore was not rich. Indeed, one might almost say that the distinguishing feature of the Johannesburg mines was the poorness of the gold-bearing rock. It was the astonishing quantity of the stuff and its even quality



A DIAMOND ORE WASHING MACHINE.

throughout which made it such a unique mining field. The great reef ran like a road in a practically unbroken line for thirty miles, with companies at work on it all the way. All that was necessary for them to do



GENERAL VIEW OF THE GOLD MINES ON THE MAIN REEF, JOHANNESBURG.

was to put down machinery on a large enough scale to handle the ore in vast quantities. There was then a sure and certain profit on every ton which came out.

This much was patent to all of us. What none of us, however, realised for years was that these companies' vaunted shafts of a few hundred feet deep were mere scratches on the surface, so to speak; that long before they reached a depth at which mining would be an impossibility, they would have come to the limits of the very narrow strips of ground they had, with foolish lack of foresight, taken up for themselves. For the reefs, it must be understood, did not go vertically straight into the ground, but slanted down in a southerly direction at an angle of from forty to seventy degrees, growing more horizontal the deeper they went.

Oh, what a chance was there for all of us who lived in Johannesburg from 1886 to 1893! The golden ball literally lay at our feet. Every time we crossed the reef to the south we trampled on the fortune which lay beneath. The ground was absolutely unoccupied, and by law was open to any one of us to peg it out for himself. So we should have acquired the rights of mining on the very same reef out of which the surface companies were already turning out millions of pounds' worth of gold bullion. The only difference consisted in the fact that a much deeper shaft would be required to reach the treasure.

Of course, when the bright idea dawned

on one man, it hit everyone else at the same time. There was a most extraordinary rush to peg out claims. Men used to wait up with gangs of Kaffirs all night. The pegging had to be done after sunrise, so each Kaffir was armed with a peg which, at the first peep of the sun, he drove into the ground. One man found that the corner of his claim came inside Booysen's Church. He rushed in and drove his peg under the altar!

Now, in addition to the old surface companies extracting gold, there are rows of these deep-level mines, with "deep-deep" mines to the south of them, and even "deeper-deep-deeps" beyond. These extend to more than a mile and a half south of where the original companies are working, and are based on the assumption of striking the reef *at over a mile deep!*

To do this is a gigantic mining proposition. In many cases it actually means that the company which undertakes it will have to outlay in hard cash at least a million pounds, and wait five or even ten years for shaft sinking, before they can even get at the gold. Nothing better illustrates the faith in Johannesburg's mines possessed by its hard-headed financiers and men of business than that such sums should be forthcoming under such conditions.

It used to be an old joke in Johannesburg that there were three degrees of liar—the liar, the adjectival liar, and—the mining expert. But the Rand mining experts, notwithstanding this hint at a vivid imagination,

in the case of the probable output of the mines, have actually, in nearly every instance, fallen far short of the truth. When Mr. Hamilton Smith, the great mining engineer to Messrs. Rothschild, reported on the Rand in 1895—if memory serves me right—he then estimated that about 400,000 ounces of gold per month would be probably the maximum the mines would produce. This amount (392,022 ounces, to be exact) was, however, turned out just before the war. His estimate would now very likely be placed at nearer double that figure. His other masterly, though cautious calculation, made two years previously, of £325,000,000 (three hundred and twenty-five million pounds sterling) of gold *still lying there* capable of being mined at a profit, vast and beyond comprehension as his figures are, has, by the testing of the reef at depths then undreamed of, been virtually proved to be only a third or fourth of the actual store of wealth awaiting realisation.

Mr. John Hays Hammond, the great American mining engineer, has since given £80,000,000 as his estimate of the gold which can be profitably got out. A still larger and more recent estimate is that given by Messrs. T. H. Leggett and F. H. Hatch, who, besides being well-known Rand mining experts, are members of the Institution of Mining and Metallurgy. These gentlemen stated last October that in their opinion the mines would last forty-two and a half years while producing £30,000,000 per annum. This is equal to a total production of £1,233,560,709. But even this estimate was based on the assumption that mining would be carried on to a vertical depth of 6,000 feet. Ground on the Rand changes hands at high figures where the reef lies at 8,000 feet.

And how is the gold extracted? Let us begin by going down one of the mines, and then follow the process throughout. You enter an empty "skip" at the top of the shaft, which has just done duty in bringing up a truck-load of ore. Suddenly the great cage sinks under you—the bottom of the world has dropped out. You are falling through black darkness to perdition. Then, just as suddenly, comes a stop. "Step here," says a voice through the blackness. But you are too frightened to step anywhere. The impression is firm within you that if you venture out of the skip, you will fall into the bottomless pit. Indeed, you are not quite sure that the invitation is not from Mephistopheles himself.

However, Mephistopheles lights a candle, and you discover him to be a very ordinary-

looking English miner, with a pleasant face. Courage returns, and you willingly follow your guide with bended head through narrow, scalp-scraping tunnels. Tiny tram-lines run under your feet, and every now and then you have to stand on one side to make way for yelling gangs of naked Zulus pushing trucks of ore along. Arrived at the end, you find more natives holding yard-long steel drills, which their brethren are driving into the hard rock with hammers. Into the holes thus made dynamite cartridges will ere long be placed. When the ore is blasted out, and the dynamite's deadly fumes have cleared, the miners will return, and the trucks be loaded and swung to the top of the shaft-head.

At this dizzy height they automatically capsize into a great ore-bin, which in a similar way loads other trucks. These run into the ore-sorting room, where the barren rock is thrown out. The good ore is fed through an opening in the floor into the great stamping mill, or "battery," beneath.

A battery is nothing else but a pestle and mortar on a large scale. Imagine a series of these mortar-boxes, in every one of which five titanic pestles, each weighing 1,000 lb., are ceaselessly rising and falling, and you at once have in your mind's eye a clear picture of a stamping mill. On one side of the stamp-boxes there is a fine sieve, through which the crushed ore, looking like gruel, is carried by water. This flows down the long, sloping plates which will be noticed in the photograph. These plates are of copper, coated with mercury. Mercury, as everyone knows, shares with many human beings the peculiarity of sticking to any gold with which it comes in contact. Once a month the plates are scraped for their precious accumulations. The "amalgam" so obtained is put into a retort, and the mercury vaporised by heat. The gold is thus left ready for smelting up into solid bars.

Unfortunately, however, much of the gold, especially in the deeper mines, is associated with iron pyrites and other metals for which mercury has no affinity. Consequently, after leaving the batteries, the ore tailings have to be subjected to what is known as the "cyanide process." This is the nearest imitation to brewing one could wish to see. The powdered ore goes into colossal vats, where it is soaked in a very weak solution of cyanide of potassium. The gold slowly dissolves into the liquid, which is run off into smaller vessels containing zinc shavings. These cause the precious metal to precipitate itself into black powder that readily smelts into fine gold.