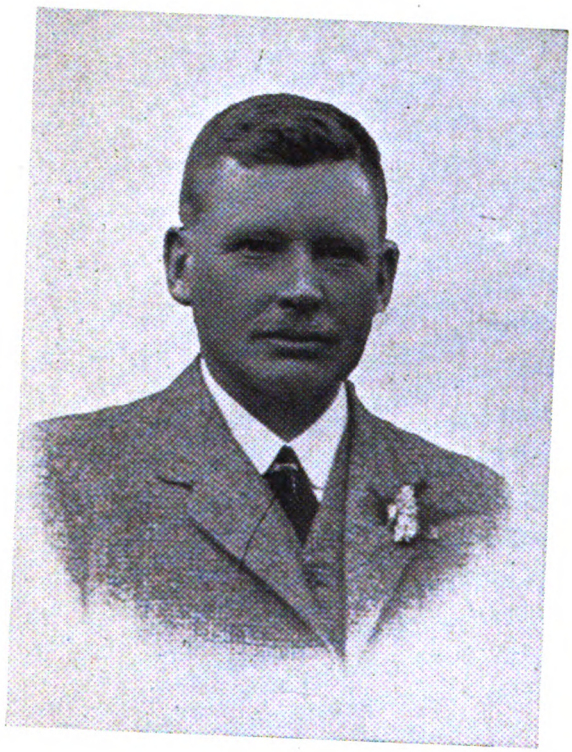

Yours faithfully
W. E. Blacock.

THE FAR EAST RAND

ITS REEFS, MINES AND SHARE VALUES

BY

W. E. BLELOCH,

Member of Lord Milner's Gold Law Commission; Member Geological Society of South Africa; Member Chemical and Metallurgical and Mining Society of South Africa; Author of "The New South Africa," "The Witwatersrand System," and joint author with A. E. O'Flaherty of "One Thousand Million Pounds for us or Germany?"

With an Essay on the National Importance of Far East Rand Gold

by A. E. O'Flaherty,

Formerly Editor of the "S.A. Mining Journal" and Editor of the "Standard and Diggers News."

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Introduction to Mining Data by C. J. Tutt.

Price 15s. of all Booksellers.

Published by the Author at 3, Transvaal Bank Buildings, Fox Street, Johannesburg.
Cables: "Bleloch," Johannesburg.
London: 3, London Wall Buildings, E.C.

Johannesburg:
Hortors Limited, Harrison Street.

1919.

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PREFACE.

For many years past, it has been the practice of the *Financial Times* and other journals in England, both directly and by implication, to inculcate in the minds of their readers that mines controlled by certain of the Mining "Houses" of the Rand are the only fit and proper mining investments for their money. The suggestion invariably is that whatever their friends handle must be good, and whatever others handle must be bad. They warn their readers against all other South African mining enterprises, even if such enterprises be based on the same reefs in the same goldfield—the Far East Rand—as those on which the enterprises of their friends are based.

These propagandist writings in this way further the interests of their friends to the detriment of all others, and they are cabled out to South Africa, sometimes by Reuter, but usually by "Our Own Correspondent," and duly appear in the South African press controlled by these same friends.

A good example of these suggestive notes and comments on Rand mining is afforded by the following cabled extract from the *Financial Times*, which appeared in *The Star* (Johannesburg) last evening, 3rd September, 1919:—

> LONDON, Saturday.—The *Financial Times* understands on the best authority that the negotiations with a view to inducing the Consolidated Mines Selection Company to take charge of the prospecting of Maraisdrift and the adjoining Northern Klippoortje farms have definitely fallen through. "This," it says, "is a bitter pill for the Heidelberg district enthusiasts, coming after the turning down by the Central Mining Corporation of the option on the Sauer-Bleloch properties in the same region, and the abandonment by the Consolidated Goldfields of its short-lived administration of the Southern Van Ryn Company." The *Daily Mail* understands that arrangements for the flotation of its Grootvlei property have now been made by the East Rand Mining Estates, and that the necessary capital has been guaranteed.

I am loath to believe that the writer in the *Financial Times*, or any English writer, can be actuated merely by malice, and for the present I am

content to think that he simply does not know. It is not possible that he can have any first-hand knowledge of the developments in the Nigel-Heidelberg district, and obviously he must be writing as he does through being misinformed. For those who know the ways of the people whose interests these articles advance, the reason why he is misinformed is not far to seek. Certain "controlling friends of the *Financial Times* no doubt fear that the opening up and development of extensive new outcrop areas carrying the valuable Van Ryn and Nigel Reefs will put an end to their monopoly of Rand Mining Finance. Their many colossal failures in the past must have shaken public confidence in their financial and mining methods, especially in regard to the deep level mines of the Central Rand. Their commitments, too, in respect of the deep levels of the Northern Van Ryn Reef Areas are heavy, and they must fear that as the fact of these new outcrop areas of the same reefs becomes more and more known the investing public will see the outstanding advantages they offer over their deeper and more difficult mines—advantages of much smaller capital, shorter time to reach the producing stage, and lower working costs.

Such articles as that quoted above therefore are constantly appearing and are read by the unsuspecting public as comments written independently and on first-hand knowledge. As to the statements in the article quoted, Maraisdrift, and Northern Klippoortje a deep level of Houtpoort, Ltd., are, I believe, owned by companies controlled by Sir Abe Bailey and Mr. Latilla. I cannot understand these financiers waiting on the doorstep of the Consolidated Mines Selection Co. for the momentous decision which, according to the *Financial Times*, has decided their fate; but if it was really so, and the bitter pill had to be swallowed, it must have been shared by these two gentlemen between them.

Of course, these properties are now, if we are to agree with the *Financial Times*, completely damned and utterly cast out beyond the pale of practical mining. Had the Mines Selection people—they must have been considering it, according to the writer—concluded the deal, the properties would no doubt, together with the neighbouring Spaarwater, the latest acquisition of Mr. Solly Joel, duly have taken their place among the legitimate Far East Rand mining propositions of magnitude and value, and then the line dividing the sheep from the goats would have remained at their common boundary with Houtpoort, Ltd. What great and deep-seeing genius of the Mines Selection Company looked down into the earth and saw that in these properties the gold was not. How discriminating, too, were those old ocean currents which laid down the reefs; they must have known millions of years ago just where to drop the gold to suit the financial book of these selected friends of the *Financial Times*.

Then the Sauer-Bleloch properties are brought into notice, only to have their "turning down" by the Corner House exultantly emphasised. I am not aware that these properties were ever under option to the Central Mining and Investment Corporation. Certainly no engineer or geologist of that Corporation

has ever seen these properties and the reefs—the Nigel and the Van Ryn Reefs—now being opened up on them.

The "abandonment of the Southern Van Ryn administration," too, by the Consolidated Goldfields is dragged into the limelight. I am doubtful whether in this case this zealous advertisement of "abandonment" will be altogether pleasing to the corporation concerned. Anyhow, the Southern Van Ryn Mine has now nearly £90,000 cash resources, of which the Consolidated Goldfields supplied £75,000, and I can say that the policy of the board is to develop both the Van Ryn and Nigel Reefs from their outcrops, and to bring the mine to the producing stage with about one-fifth the expenditure required by a deep level policy. The company's Consulting Engineer is confident that this can be done with the money now available.

How wide of the mark is this sustained campaign of eulogy of its selected friends and implied condemnation of all others, to the end that the investing public may believe the mines they control alone are run on model business and engineering lines, may be judged by reading the following extracts from No. 2 of a series of articles by Mr. Lionel Harris now appearing in the *Rand Daily Mail*:—

> "The mines at present are controlled by an extraordinary mixture of boards of directors, groups, and the Chamber of Mines. The first are really negligible now, as the groups nominate a majority of members, and the real control lies with the groups.
>
> "The unfortunate fact is that the groups themselves are boards of control just like the one in recent history that took over the town of Johannesburg. They do not represent anyone except the financial houses, least of all the shareholders. It might be expected that such controlling bodies would include men who had studied mining as a profession and who were in touch with the work being carried on. Instead it will be found that promoted clerks and office boys form a majority; the remainder include a few book-keepers and accountants, one or two lawyers, and perhaps a doctor or a commercial man. None of the able if unscrupulous men of energy and character who helped to found the industry from the financial side are left to help solve the problems they helped to create.
>
> "INEFFICIENT CONTROL.
>
> "In early days one can remember consulting engineers, managers and retired mining men acting as directors, and in Kimberley it still is so. Nowhere else in the world can an industry be found in which the ultimate control is absolutely in the hands of those unacquainted with its real

working. True, they have technical advisers and consulting engineers, but a few totally ignorant men may override advice they cannot understand and have the appointment of these same advisers, who have not always been chosen for outstanding ability.

"Is it surprising that on the greatest gold mining field in the world, with the most intricate and interesting method of treatment, the local School of Mines could not attract more than seven mining students in three years?

"I think sufficient has been written now to show that the group system as now existing arose from incompetence and gave rise to inefficiency all round. Signs are not wanting that its deficiencies are being recognised slowly and that the technical man is coming once more into his own."

I would not go so far as to write thus disparagingly of these local chieftains of mining finance, but as an example of what Mr. Harris writes about I will state the fact that in the Nigel-Van Ryn Mine, formerly the old Marievale Nigel —Neumann control—we have found hundreds of feet of driving, practically the whole mine developed, not on the reef, but on a dyke contact in the hanging wall quartzites. We are now developing virtually a new mine on the Nigel Reef 20 feet below the old workings. One of the Government inspectors of mines was shown this, and I have invited the engineers of the Corner House to come and see it if they wish.

This news of the Nigel-Van Ryn Mine should be of interest to the *Statist*, which went out of its way to condemn the enterprise on the grounds that the property had been tested and abandoned as worthless by the Neumann House 20 years ago. It may add to its interest to be told that, with £12,500 of working capital supplied from London, this mine is now entering the producing stage, and the payable ore developed and ready for the mill, end September, is estimated at 12,000 tons of 8 dwts. value. This will be the first of these new South-East Rand mines, organised and financed outside of any group control, to enter the producing ranks. And the Southern Van Ryn Mine will be next.

As the Consolidated Mines Selection Co. and the Consolidated Goldfields of South Africa are both our neighbours, having large interests in the immediate vicinity of the Southern Van Ryn Mine, I will act in a neighbourly way and refrain from the obvious rejoinder in regard to them which the *Financial Times* article calls for; but to bring clearly before the reader what it means blindly to follow the lead given by the *Financial Times*, I have compiled the following statement exhibiting the depreciation of seven Corner House stocks.

	Issued Capital.	Highest Price.	Highest Market Value.	Present Price. September, 1919.	Present Market Value.	Depreciation.
Village Deep	£1,060,671	1905. 6¼	£6,629,194	14/3	£755,728	£5,873,466
Witwatersrand Deep ...	£550,000	1905. 4¾	£2,612,500	13/6	£371,250	£2,241,250
East Rand Proprietary Mines...	2,445.897 shares 1,500,000 debentures Outstanding 1918— £835,620.	1905. 9¼	£22,624,547	5/9	£703,195	£21,921,352
Crown Mines	£1,000,000 in 2,000,000 10/- shares 1,000,000 debentures Outstanding 1918— £573,000.	1909. 9¾	£19,500,000	2⅜	£4,750,000	£14,750,000
Nourse Mines	£827,821	1909. 3¾	£3,104,329	13/-	£538,084	£2,565,245
Bantjes	£502,306	1909. 4¼	£2,134,800	3/-	£75,345	£2,059,455
City Deep	£1,250,000	1910. £5	£6,250,000	58/6	£4,250,000	£2,000,000
			£62,855,370		£11,443,602	£51,410,768

The above statement takes no account of the debenture issues of the E.R.P.M. and Crown Mines.

FIFTY-ONE MILLIONS STERLING DEPRECIATION.

I feel certain that this statement will not appear prominently in the columns of the *Financial Times*, nor do I think that it will be cabled out to South Africa by "Our Own Correspondent," nor by Reuter either. Nevertheless it is true, and I think it will suffice to show the folly of accepting as gospel what the *Financial Times*, day in and day out, suggests, viz., that the only safe way to invest money in Rand Mines is to buy Corner and Kindred House stocks.*

The statement, too, will serve as a contrast to the statement of appreciation of market values and the extraordinary returns now being obtained from the mines on the Van Ryn and Nigel Reefs of the Far East Rand, as compiled by Mr. H. S. Denny and to be found on pages 9-13 of this book.

Further, details of the capitalisation, areas, estimated tonnages and values of these mines of the Far East Rand will be found on pages 24 *et seq.*

A study of these estimates will enable the reader to form a fair idea of what return he is likely to get from any investment he may have made or may decide to make in the developed and producing mines of that area, and it will enable him to consider on its merits, and without the suggestive aid of the *Financial Times*, the question of whether he should not put some of his money into the new mines of those Southern areas of the Far East Rand, free from German finance, where the same valuable Van Ryn and Nigel Reefs are now being opened up from their outcrops.

I repeat, mines on the same reefs requiring less than a third of the capital expenditure and one-fourth to one-fifth of the time to reach the producing stage, mines where the working costs will be lower and the tonnages and profits consequently higher, and mines in which at present he can obtain a holding at prices which must appreciate five to twenty fold before they reach the top prices now demanded for the shares of the deep level mines.

Finally, I commend to my readers, especially those of them who are shareholders in the East Rand Proprietary Mines and those of them who live in the threatened town of Boksburg, consideration of the Notes on the Geology of the E.R.P.M. Mine, pages 17 and 18, and the plan which accompanies them. In 1911, when East Rands were still 80s. to 90s. on the market, Mr. R. B. Mabson, the Special Commissioner of the *Statist*, after visiting the East Rand and the Far

---

* I beg of the reader to take note that I do not make sweeping and unwarranted reflections without chapter and verse after the manner of the *Financial Times*. Readers of this book will see that I quite recognise that all the "Houses" are not equally *unfortunate*, and that some of them run their mines in the interest of their shareholders efficiently and well; even the unfortunate ones have some bright spots in mines which are models of up-to-date methods. What I wish to hold up to the public view is the unjust and untrue yet reiterated suggestion that they, and they alone and always, are worthy of confidence and support.

East Rand with me, in a letter to his paper (*Statist*, May, 1911), wrote as follows :—"*But if the Van Ryn series is truly the Rietfontein series, what has become of the Main Reef series? Has it abruptly stopped at the Cason? Certainly immediately east of the Cason, at the Blue Sky, the nature of the ore deposit which I saw is entirely different from that immediately to the west. . . . Mr. Bleloch comes to the conclusion that the Main Reef series . . . bends gently south from the Cason.' . . . 'A great deal has yet to be learnt.' All that I have called attention to must not be regarded as wearisome technique. It has an important bearing upon the fortunes of the companies in the region, and though it would be presumption on my part, as a non-expert, to offer an opinion as to whether or not Mr. Bleloch is right, certain of the facts and showings I saw with my own eyes were of a startling character.*"

I invite the writer in the *Financial Times* to come out, too, *and see with his own eyes.*

As the result of an interview with Mr. Harrison, representative of the Federation of British Industries, I am posting several copies of this book to the head office of the Federation in London.

I pointed out to Mr. Harrison that the opening of the new Southern areas of the Far East Rand goldfield is a matter of importance to British manufacturers of mining machinery. I also pointed out that it greatly depends on whether these great new areas are financed and controlled by British or by alien capital where the orders for the machinery and plant required to work these new mines will go. I have written, and collaborated in writing, books showing how in the past, although the actual cash which financed the mines came out of South African, British, and French pockets through the purchase of the shares at high premiums from the German finance houses and banks which organised the companies and guaranteed the capital originally, the control of the mines was retained by these aliens, and in consequence a great many of the orders for the machinery were given to Germany. It would pay British manufacturers and British banks to take a real interest in these new areas, even by combining to supply part of the capital required, and so get into a favourable position to secure the greater part of this remunerative business. That is what the Germans did before the war, not only with the South African gold industry, but with industries in nearly every part of the world. Prince Bülow, in "Imperial Germany," says: "When employers, princely merchants . . . . . were found to take advantage of these favourable conditions, the successes of the immediate future were bound to fall to industry and commerce."

To my mind, the great load of debt now laid on the Old Country is too heavy for its resources—great as they are—to bear. It is absolutely essential that the base of the industrial and financial structure should be broadened, and this can only be done by securing ground floor and controlling interests in such

enterprises as the Southern areas of the Far East Rand Goldfield present. Steps should also be taken to acquire similar interests in the great coal, oil shale, iron, copper, sulphur and nitrate deposits of South Africa, and also in the great expanses of land still available in this healthy and fertile sub-continent. For this reason, I urged in letters to the British Board of Trade and the British Treasury, and especially in regard to the new Nitrate of Potash industry, that the restrictions on investing capital in South Africa should be removed at the earliest opportunity. I understand that this has now been done, and none too soon.

If the path indicated in these few lines is followed, not only in regard to South Africa, but also in regard to the other Dominions, and the Crown Colonies too, and the enormous material resources of all the Dominions and of all the Crown Colonies are developed, at once to the benefit of each and every separate Dominion and Colony and to the consolidation of the Empire as a whole, I feel sure that British trade and industry will increase by leaps and bounds and be such that within a comparative small number of decades the load of debt will be got rid of, and all the people, both in the old country and throughout the Empire, will enter on greater prosperity and live in greater security than ever before.

I am indebted to the *South African Mining Review* and to the *South African Mining Journal* for statistical data; and to my wife and to Mr. E. G. Bryant, M.A., B.Sc., for the mathematical calculations of present values.

Estimates of the gold and profit values of the mines of the Far East Rand worked out on similar lines to those of these estimates which appear in this book were contributed by Mr. Lewis Watkins and myself in 1917 to the *South African Review*, Capetown. Thanks are due to that enterprising and fearless journal for the help it gave in spreading knowledge of their great new goldfield among the people of South Africa.

W. E. BLELOCH.

Johannesburg,
September, 1919.

NOTE.—Those in London who may wish to see the specimens referred to in the text, will be able to do so on application to Mr. Robert Bleloch, 3, London Wall Buildings, City.

National Importance of Far East Rand Gold.

(By A. E. O'Flaherty, formerly Editor of *S.A. Mining Journal* and Editor of *The Standard and Diggers' News*.)

In "A Thousand Million Pounds: For Us or Germany—The Gold of the Far East Rand" some consideration was given to the argument: Is gold worth having? in view of the statements that gold was alleged to be in process of demonetisation. In taking the affirmative, I was guided solely by the living fact that the nations, whether belligerent or neutral, were taking every step to secure gold, and that they showed no signs of trying to do without it, even if that were possible. Gold, in fact, was the first thing commandeered—universally commandeered. Of the nations, the U.S. of America has been able to secure, for the first time in history, not only a supply equal to the demands on the Treasury, but a surplus—a dominant surplus—which, owing to what I called "gold-power," enables America to exact a heavy toll, in prices, from the debtor nations. Various steps have been taken to adjust the exchange, but nothing has availed to alter the fact that the nation, or individual, holding the gold-power can, and does, call the tune. The United Kingdom with the rest of the world is now dancing to that tune. Further, though it has frequently been stated that the U.S.A. had enough gold and wanted no more, the President of the Transvaal Chamber of Mines stated on 22nd September, 1919, that America had just purchased gold in the "free market" at a high premium, *i.e.*, about 99s. per ounce.

Within about two years from the outbreak of the war the Currency Note had displaced the gold currency in the United Kingdom, and now the Currency Note is double the pre-war gold currency, and this without counting the paper credits created in Egypt, Archangel and elsewhere. The "Committee on Currency and Foreign Exchanges after the War" has recommended (1918 Report) the restriction and withdrawal of Currency Notes with a view to restoring the metallic currency. By what means is the gold to be secured? The boasted gold-currency of England has entirely vanished, and a paper-currency of over twice its pre-war amount has taken its place. How is this to be met?

In our book referred to, I pointed out that the policy of the German Bank Control of South Africa—of which the evidence was presented in detail—was to supplant London as the centre of world finance. This was not a supposition, but had been plainly stated by several authoritative German writers (*e.g.*, "Das englische Bankwesen. Edgar Jaffé. 2te Auflage. Leipzig: Duncker und Humblot, 1910). In the *Quarterly Review* for January, 1919, Mr. A. D. McLaren wrote: "Since the war several well-known German economists have written and spoken on the probable future position of the German banks, and especially on the part they are destined to play in *Weltfinanz*. Their special aim, it is declared with remarkable unanimity, should be to oust London from its position

as the centre of this world-finance, and thus emancipate Germany from the necessity of resorting to London at all for the purpose of effecting financial settlements arising out of Germany's international trade."

In this connection the "Report of the Executive Committee" of the Transvaal Chamber of Mines which is on the agenda for the September meeting is significant: "*Marketing of Gold.* The arrangement by which the Bank of England purchased the Transvaal gold output, taking delivery in South Africa, has by agreement terminated, and a new arrangement been entered into. Under the new arrangement all gold, with the exception of such little quantity as may be required for local currency requirements, will be consigned to the Bank of England, but will be sold by the gold producers' agents, on their behalf, in the best available market. Messrs. Rothschild have been appointed agents for this purpose." This is in exact concordance with the prophecy made in our book.

The statement requires attention. The precise means by which "India" is to give us 99s. for our gold in place of the 77s. 6d. offered by the Bank of England is not made clear. That "India" requires gold like every one else is certain, and last week the Union *Government Gazette* contained an announcement prohibiting the withdrawal of Union sovereigns. It seems that immense quantities of these coins have been smuggled to "India" *viâ* Delagoa, and the Union currency seriously threatened. Of the character of the "gold producers" who will have the marketing of the gold it is hardly worth while saying more. Their associations and antecedents have been fully described in our books, "A Thousand Millions, Etc.," and "The German Plot in South Africa." The German Bank Control was fully exhibited, and I am not aware that anything has occurred to change the fact, beyond the addition of a few more nominees in the place of the unnaturalised directors. With such "gold producers," who were able to devote the gold belonging to English and French shareholders to German, Austrian, Bulgarian and Turkish low per cent. loans before the war—the money being still there, as revealed in the exposure of the Central Mining and Investment Corporation in the early part of the war—with such "gold producers," controlling English-owned gold through the German "Group System," what hope have we that the gold will not be marketed, on their instructions, to the loss of the British and French shareholders and to the damage of British banks and of the London market? That some of them will go to any lengths has been proved in our Courts, though no action has been taken. A director of some of the most important Rand companies proved guilty during the war of correspondence, direct and indirect, for the advantage of a notorious enemy firm like Orenstein-Koppel actually continues to direct. ! Actual ownership of the gold is not required, as the practice and investments of the "Corner House" have taught us. A German control of a company can divert the British shareholders' gold, for long periods at a time, either to national loans or to its financiers, who are thus enabled to determine the rise and fall of the discount rates in London, which, of course, depend upon the varying supply and demand for gold. If during the next twenty or thirty years the control of upwards of one thousand million pounds' worth of Rand gold is to be placed in the hands of German, or "international," financiers, it must follow that the London money market will be at their mercy.

Very much more might be said in this context, but I will confine myself to one or two practical issues. If South Africa and Britain want to get possession

of this keenly sought gold, their citizens must be awake to the opportunities of investment, and the necessity for appointing controlling Boards of men of their own undivided allegiance.

Had our recommendation been followed out, and the Imperial Government joined with the Union Government in exploiting the Government ground on the Far East Rand, and aided rapid production by easily available resources, the Union would now be on the way to extinguish its Public Debt, if that were desired, and the United Kingdom would be assured of a constantly increasing gold supply, for twenty or forty years, at a large profit and certain of its destination. We do not regret our campaign. Its effect was to send up the prices offered in the tenders for leasing, so that the Union stands to get upwards of fifty millions from the formerly state-owned ground then represented in the London and South Africa financial press as "dangerously risky," "gamble," etc., etc., and which it was seriously proposed to Parliament by Group Representatives should be given out *for nothing* beyond the nominal Profits Tax. Although leases have been decided on, much ground is open for profitable exploitation.

In "A Thousand Millions," the gold lying in the Far East Rand was computed at that figure. This amount has never been challenged by any responsible mining man. And for this simple reason. It was a deliberately conservative under-estimate based on gold extracted, and the development sampled extending into hundreds of millions of tons. Work done since those calculations were made has greatly enhanced the figures, and the market prices have advanced accordingly. Thus the share-value of Government Mining Areas, as stated to the Select Committee of Parliament, was then 34s. The shares stand at about 95s. to-day. A striking point was made before the Select Committee, which has passed without comment. Both the Government Mining Engineer and other witnesses told the Committee that the figure 34s. was not high, as it only amounted to par value *plus* 7 per cent. compound interest. That the market should be willing to give 7 per cent. compound interest on the par value of stock in a company which had pledged itself to Government to *spend* £1,400,000 on a property upon which it had not then sunk a shaft or bore-hole, and had since driven many hundreds of feet without disclosing a pay-value, was, in fact, a remarkable confirmation of the now widely known fact that the Van Ryn Reef does not fail in its characteristic values whether you go eight or twenty miles on the reef from its northern or southern outcrops. The Far East Rand, then decried as "risky," "flat," and "patchy," is now acknowledged by the press, the market and the financiers as the mainstay and chief part of the Witwatersrand Goldfields. It is, indeed, laughable to read the eulogies of this area in the *Financial Times*, for instance, as compared with the doleful estimates when the leases were applied for but not yet granted. (See, for instance, the significant statement by Mr. H. S. Denny, page 9, *infra*.)

If to the figures now presented by Mr. Bleloch for some 40,000 claims only there were added the figures similarly worked out in detail for the areas he has not dealt with, the result would show nearer Two Thousand than One Thousand of Millions on the Far East Goldfield. But these figures are unassailable, and are not likely to be assailed—and for this important reason. The present value of shares, worked out on the basis of the estimated tonnage, in the companies

at work very closely approximates, in the case of the "Big Houses" at least, to the actual market values. To condemn these figures is to say that these market prices are not justified: and that is very far from what the financial press suggests week in and week out. And what is true of the gold areas of this district is not less true because all of it is not controlled by "Big Houses."

On such valid data, Mr. Bleloch now shows how the British investor can "get in on the ground floor," and be free from alien control.

These facts deserve the serious consideration and energetic action of British bankers, traders and producers. For it is not only the profit from gold exploitation, nor the alien bank control of gold that is at issue. The whole course of trade and production follows the "politique bancaire" of Germany. I have shown how the German Bank guarantees threw the trade orders of British companies on the Rand into German hands, and even while the war was in progress directors placed immense orders with the notorious firm Orenstein-Arthur Koppel, whose branches have been convicted of espionage and provision of military as well as of commercial intelligence to the Berlin principals and to the Reichsbank, which, as Herr Riesser has told us, is "a Kriegsbank in a very special sense." It will not be forgotten how the London market was paralysed in 1914. "The outbreak of the war was followed by an instant collapse of the exchanges. The London houses, all head offices and drawer offices everywhere, telegraphed to their succursales to stop drawing. Instantly the creation of exchange media ceased. Further than this, there was a mass of bills already drawn and on the way by sea and land, but unaccepted; and, still further, there was another mighty mass of bills already accepted and maturing, as to the honouring of which the mercantile houses were in an agony of doubt. They stood to risk bankruptcy by honouring their acceptances, for the chain by which they could recoup themselves had been snapped; and, on the other hand, a general dishonouring of bills would have spread ruin throughout the community" (W. A. Shaw). That agony was heralded by the action of the Dresdner Bank, one of the principal controllers of South African finance. "On July 18 last," said the late Sir Edward Holden, of the City and Midland Bank, in January, 1915, "the Dresdner Bank caused a great commotion by selling its securities and by advising its clients to sell their securities. This was recognised as the first semi-official intimation of a probable European conflagration." The "unpreparedness" of British financial institutions led to emergency legislation, which not only greatly increased the cost of the war, but sowed bitter political seeds among certain classes, which is now putting out bitter fruit. The German banks, organised with German trade, threw this responsibility for meeting bills and acceptances on their British victims. There was no surprise, no panic in Germany. "Shortly after the outbreak of the war, Herr Karl Helfferich contrasted the state of feeling here and in Germany, in regard to financial stability, taking the absence of a German moratorium as the text of his remarks. On September 9, 1914, Herr Havenstein, President of the Reichsbank Direktorium, said that the plans for the financial mobilisation of Germany, thought out and prepared down to the final details by all the institutions concerned, had proved to be of extraordinary efficiency. 'There was no breakdown, no leakage.'" Now, this mobilisation of capital goes on constantly in times of peace, even more effectively than it did in time of war. It is not only parasitic on British finance, which it exploits, but it is constantly mobilised, with the united and co-ordinated strength of the German Banks joined with the traders

under their protection, against the English banks, the English traders and the English finance. South African gold is one of the chief *points d'appui* in this peace-war. The index-cards captured from the Dresdner Bank branch in London (much against the wishes of the authorities!) reveal the extent of their financial and commercial plotting in South Africa. If the Group Control is left in the same hands, the economic control of the gold, industries, trade and immigration of South Africa will be a German appanage.

"Just as after the 1901 crisis there was a growing demand for money in Germany, due partly to the effort to intensify large-scale production, and partly to competition for raw material, so after the present war we know that her industry will require credit in an easily accessible form. In self-defence our own banks will be compelled to take measures to protect our industry from a system which, before the war, was threatening our commercial citadel." So writes the Quarterly Reviewer, but so far as South Africa is concerned we see only the preparations made by the pseudo-British agents of the Germans. The demands on British currency, if production is to meet the bills, must be not less than three times the pre-war figure. All over the world the immensely increased wages bill added to other obvious demands will increase the demand for gold, as we see that demand increasing to-day. That demand must be mainly directed to the gold of the Transvaal. Mention is made above of the curious fact of a premium of 22s. per ounce being paid for gold, while the purchasing power of the sovereign is at its lowest. Whether this premium will continue to be paid, through manipulation of exchange, cannot be foretold. If it does, the values presented in this book must be greatly increased.

Thus South African gold is one of the main objects of the preparations and the "mobilisation" of German Bank finance. And they are perfectly justified in reaping the gain due to their intelligence and the information gained at our expense. South African and British readers will consider whether they will not be moved, if not for national safety, then for individual gain, to take a controlling part in the opening up of the gold areas, whose values are calculated for them by Mr. Bleloch in this book, and which are destined, in capable hands, to control the course of trade, industry and production, the rates of interest and discount, among the nations and money markets of the world.

INTRODUCTION TO DATA

By C. J. Tutt.

At the request of the Author, I am writing a brief foreword to "*The Reefs of the Far East Rand.*"

Geological investigation of the Far East Rand by the author and others during recent years has disclosed facts that can no longer be ignored by the Geologists and Mining Engineers who are interested in the development of the enormous area containing the gold-bearing reefs—bankets—of the Witwatersrand System.

A series of articles which appeared in the *S.A. Mining Journal* recently pointed out very clearly the importance of these investigations and compared the evidence gathered by Mr. Bleloch with the opinions held by the orthodox Geologists or "One Reef Theorists."

During the past seven years I have been engaged, first as a Miner on the New Modderfontein, and later on the Official Staffs of the Government Areas, Brakpan, Springs and Southern Van Ryn Mines, and I have had excellent opportunities of examining and studying the Reefs of the Far East Rand.

The "One Reef Theorists" contend that the "Van Ryn Reef" Series and the "Nigel Reef" of the Far East Rand are the continuation of the Central Rand Main Reef Series; in other words, that all mines on the Witwatersrand are working the "Main Reef Series" only.

Against this "One Reef" theory, the Author establishes, on the evidence he puts forward, that there are several payable reefs quite distinct from each other, both in their position—stratigraphically—and in their appearance and material. Prolonged investigation of the evidence gives me no alternative but to agree with him. In fact, I cannot understand how any one who has seen and examined the several reefs, both at their outcrops and in the many mines where they are being worked, could arrive at any other conclusion.

The "Van Ryn Series," which is being worked by the Kleinfontein, Van Ryn Estates, Van Ryn Deep, New Modderfontein, Modder B, Modder Deep, Geduld, Brakpan, Government Areas, Modder East, Springs and the Southern Van Ryn Mines, is certainly not the "Main Reef Series" of the Central Rand. The characteristics of these two reefs, or rather series of reefs, are distinct in matrix, pebbles, and bedding. The gold values are deposited in the "Van Ryn Series" in shoots that extend in depth. On the other hand, values on the "Main Reef Series" are found in patches, and the evidence of the deeper mines is that they decrease in depth.

The "Van Ryn Series" again is distinct from the "Nigel Reef," that is to say, it is not the reef that is being worked on the Daggafontein, Sub Nigel and Nigel Van Ryn Mines.

The "Nigel," a single reef, underlies the "Van Ryn Series," being about 1,400 feet lower. It differs from the "Van Ryn Reef" in pebbles, matrix and bedding, the differences being of a most marked and striking character. Generally speaking, the "Nigel Reef" is a small pebbled reef with a dark matrix; its outstanding feature being a red jasper pebble that is peculiar to this reef. This reef is always found lying directly above a yellowish or "khaki" coloured shale, that is characteristic of the "Nigel" footwall, the "Van Ryn" shale being greyish in colour at the point of contact.

The gold values of the "Nigel Reef" are also carried in shoots similar to the shoots of the "Van Ryn" Reef, but differ in this respect, that whereas the "Van Ryn" "Pay Shoots" average from 50 to 80 per cent. of the total reef areas on the mines that are working that reef, the "Nigel" "Pay Shoots" only average 30 per cent. of the total reef areas on the mines that have opened it up.

It is the "Nigel" Reef that is now being developed at a depth of from 3,500 to 4,000 feet from the No. 1 Shaft, Daggafontein. 1,500 feet above this the "Van Ryn" Reef was intersected in the No. 7 Borehole, assaying 18 dwts. over 7 inches. The Borehole was put down within 100 feet of the No. 1 Shaft, yet this important and valuable "Van Ryn" Reef has been neglected for the less important and markedly different "Nigel" Reef that is now being developed 1,500 feet below it.

The "Van Ryn Series" at its northern outcrop consists of a number of reefs, usually seven in all, that are separated in some instances by quartzite or quartzitic schist. In other instances it has been deposited in one large bed of reef many feet in thickness. The Henderson Nigel Shaft, situated at the south end of the Southern Van Ryn property, opened up the Van Ryn Reef 18 feet in thickness. At Brakpan, Springs, and the Government Areas it has also been found in bodies of from 12 to 15 feet in thickness. Again, on the Eastern Van Ryn and Modderfontein, and the Houtpoort properties in the Heidelberg District, it has been opened up, and at some places is 12 feet in thickness, with 3 to 18 inches of quartzite intervening between the various leaders.

The "Van Ryn" Reef has several outstanding features that distinguish it from the other payable reef—the "Nigel"—of the Far East Rand. Chief among these features are a black glassy quartz pebble, a quartz porphyry pebble, and a striped quartzite pebble—all characteristic of this reef. These pebbles are generally large, some of them being very similar in size and shape to a hen's or goose's egg. The matrix of this reef is also lighter in colour than that of the "Nigel" Reef.

The identification of these several reefs by their material, appearance, and stratigraphical position, is, in my opinion, a more reliable method of recognising them, than that of depending on the "Diabase" marker that has hitherto been used for the identification of the "Main Reef Leader" of the "One Reef Theorists." This diabase, in some cases amygdaloidal, has, wonderful to relate, been accepted by these gentlemen as the principal, if not the only factor in identifying their "Main Reef Leader," and the distinctive individual characteristics of each of the several reefs, persistent over long

distances, have been deliberately ignored by them. They have stated, time and again, that this igneous rock represents a contemporaneous lava flow, and that it is found lying conformably above their "Main Reef Leader." Before accepting this statement unsupported by evidence, I would ask for an explanation of the following:—

Why, if the "Diabase" is a flow, does it occur in varying numbers of bodies in the shafts and boreholes sunk on the Far East Rand?

Compare sections of No. 1 Shaft and No. 7 Borehole on Daggafontein Mine; they are less than 100 feet apart. The Shaft section shows two distinct bodies of igneous matter, whilst the Borehole shows three, and these at different horizons. Again, if the Diabase is an interstratified lava flow, why does it cut through the bedding planes of the sedimentary formation? If it were a lava flow, would it not be found to be conformably interbedded?

On the evidence I have examined and studied for several years past, I can state definitely that this igneous material is intrusive, and that it was forced into the weakest places of the earth's crust in that area during the period of eruptive activity, and that it cannot be taken as a marker to identify any section of the sedimentary formation into which it was thus forced.

Quite recently I have had charge of the sinking of several boreholes in the Nigel and Heidelberg Districts, some of these boreholes reaching a depth of nearly 3,000 feet. In no instance was a deep hole put down without intersecting one or more bodies of igneous rock—Diabase and Amygdaloidal Diabase—and in no instance did I find the contact of the igneous and sedimentary rocks conformable with the bedding planes of the latter. As a matter of fact the evidence in every case showed that the igneous rock was intrusive and that it invariably traversed the bedding planes of the sedimentary rocks.

The characteristic material and stratigraphical position of the banket beds seem to me to be the only evidence on which to identify any particular reef or series of reefs of the Witwatersrand System. To my mind the diabases and other intrusive igneous rocks which occur in the system are unreliable and misleading if taken as markers, and were it not for the difference in pebbles, matrix, bedding, and general appearance of these several reefs or series of reefs, it would be impossible to correlate the reefs from area to area with any certainty.

A section of the formation outcropping at Spaarwater, Sub-Nigel, and Nigel is as follows, reading in ascending order:—

Molyneux Reef, resting on a shale bed.
Nigel Reef, resting on a shale bed.
Van Ryn Series, resting on a shale bed.
Rietfontein Series—so-called Kimberley Series of the Far East Rand, resting on a quartzite bed, with a shale bed some 250 feet below.

Further to the north, that is higher in the same section, the Main Reef Series, the Kimberley Series, and the Elsburg Series of the Central Rand are also to be found outcropping. Again, at Houtpoort, Limited, and on the

Eastern Van Ryn and Modderfontein Company's properties the same sequence of beds is found. Boreholes sunk on the Southern Van Ryn, Daggafontein, Spaarwater, Eastern Van Ryn and Modderfontein, Houtpoort, Eendracht, and Boschhoek properties have proved the same sequence of beds, and in every instance the marked characteristics peculiar to each of the several reefs and series of reefs are in evidence.—(See the author's *Geological Plan of the Nigel-Heidelberg Districts*, and my own *Surface Working Plan of the Properties of the "Houtpoort, Limited," and "Eastern Van Ryn and Modderfontein Gold Reefs, Limited."*)

On the evidence I have briefly presented, which is to be seen on the mines themselves and in the records of the shafts and boreholes of the Far East Rand, evidence which I am prepared to show to any investigator in the field, I have come to the following conclusions :—

(1) That the geology of the Witwatersrand System as laid down and obstinately adhered to by the "One Reef Theorists" is incorrect and misleading.

(2) That it has caused losses of millions to investors in mines working on wrongly identified and unpayable reefs.

(3) That it has seriously delayed the natural expansion of the Rand Gold Mining Industry.

(4) That the reading of the geology of the Witwatersrand System, including the identification of the reefs of the Far East Rand set forth briefly by the author in this treatise, is based on unmistakable facts and data, and is, in my opinion, unassailable.

THE FAR EAST RAND

ITS REEFS, MINES AND SHARE VALUES.

PART I.

DESCRIPTION OF THE REEFS IN ASCENDING ORDER.

1.—MOLYNEUX REEF.

This Reef lies on the contact of the first large shale bed below the Nigel Shale. It is generally a small pebble Reef rich in pyrite and with occasional rich patches of gold, but these are too small in area and too infrequent for the Reef to be payable. The Reef varies from a mere contact to a maximum of 18 inches in thickness; average, say, about 3 inches. (*Specimens 1 and 2.*)

Note, the Tatham Reef lies at the top of the Molyneux quartzites and below the Nigel shales. See Map.

2.—NIGEL REEF.

This Reef lies at the contact of a wide shale bed known as the Nigel Shales. This is the only important shale bed lying between the Molyneux shale below and the Van Ryn shale above. The Nigel is generally a small pebble Reef with occasional pebbles of up to 1 inch or a little more in diameter. About 80 per cent. of the pebbles are of white and greyish white vein quartz, the remainder being dark grey and brownish fine-grained quartzite pebbles. In this Reef there occurs the striking Red Jasper Pebbles, some of these being almost as bright as red sealing wax. This particular Jasper Pebble is, so far as I know, peculiar to the Nigel Reef. In the Van Ryn Reef (Modder B., Geduld, Southern Van Ryn) there are occasional red and reddish brown striped Jasper Pebbles, but these are different from the Jasper Pebbles of the Nigel. The white and greyish vein quartz pebbles, when freshly fractured, have a peculiar oily lustre, as if they had been wet with paraffin oil. The quartz pebbles in this Reef are mostly round in section, some being almost spheroidal, quite different from the shape of the quartz pebbles in the upper portion of the Van Ryn. The matrix of the Reef in the unoxidized zones is usually very dark, and the pyrite, which is abundant, is partly coated with dark soot-like material. The gold in the Nigel Reef is usually dark, almost brownish yellow in colour. It is in fine but heavy particles, which lie back in the pan, and are easily collected into a round thick tail lying behind the pyrites, from which the gold is easily separated. This feature is strikingly evident to the prospector who pans this Reef after panning the Van Ryn. In the Van Ryn Reef the gold is invariably

lighter in colour, brighter, many of the particles are flakey, and it is difficult, if not impossible, to separate these flakey particles from the pyrites even by the most careful handling of the pan. Unlike the Van Ryn, the Nigel is a single Banket Reef. There are no gold-bearing leaders in the hanging wall available to increase the pay tonnage.

The Nigel Reef varies in thickness from a mere contact to a maximum of about 30 inches, the average being about 8 inches. It contains well-defined pay shoots, which are often very rich in gold. These pay shoots have been found to occupy about one-third of the areas of the mines in which extensive development has been done on this Reef. The sets of specimens of this Reef presented illustrate clearly the consistent and persistent, practically unchanging character of the Reef in its matrix and pebbles over great distances; the outcrop shaft, 1¼ miles north of the outcrop line of the Main Reef Series, from which the specimen from north of Boksburg was taken, being about 60 miles from the shaft from which the Hex River specimen was taken. Many of the features of the Reef above described are brought out clearly when the specimens are dipped in clean water. The payable tonnage of this reef, as shown in the Nigel and Sub-Nigel Mines, which have worked it extensively, varies from 4,000 to 5,000 tons per claim. (*Specimens 3-13, photograph (3).*)

3.—VAN RYN REEF.

This Reef, the most important gold-bearing Reef in South Africa, or in the world, lies either at, or within 250 feet above the contact of the large shale bed known as the Van Ryn shale, that is, No. 3 in ascending order of the shale beds so far referred to in these notes, and about 1,500 feet above the Nigel Reef. This Reef or rather series of Reefs comprises in some mines as many as seven distinct layers of banket separated from each other by bands of quartzite of varying thickness, the whole, even including the quartzite partings, being more or less gold bearing. The pebbles forming the banket are generally large. Beginning with (No. 1) the footwall body, that is, the Van Ryn Reef proper, pebbles are found in the Reef body as large as hen's eggs, usually rather sparsely embedded in a matrix of micaceous sandstone, quartzite in depth. White, greyish white, blue and glassy black vein quartz pebbles are plentiful, while grey striped, fine sugar-grained quartzite pebbles are present, but not so plentiful. This body varies in thickness from a mere contact to 4 or 5 feet in thickness and is a great gold carrier.

The next body (No. 2), known as the Upper Van Ryn Reef, 3 inches to 3 feet thick, has larger pebbles, many of peculiar shape, like large goose or turkey eggs, occasional specimens being practically small boulders. In this body the striped, sugar-grained quartzite pebbles are rather more abundant than in No. 1.

The next body (No. 3), known on the Van Ryn Estate Mine as the A Leader, is usually from 1 to 6 inches thick and has much smaller pebbles than Nos. 1 and 2; and the same applies to the next body (No. 4), known as the B Leader.

The next again (No. 5), known as the C Leader, has larger pebbles, also of the egg-shaped variety, and there is a greater proportion of striped, sugar-grained quartzite pebbles in this Reef than in Nos. 3 and 4. These three Reefs, Nos. 3 to 5, are distinguishable to the mine samplers by their pebbles and matrix from the Reefs Nos. 1 and 2, and also from the next two Reefs, Nos. 6 and 7.

No. 6 is known as the Carbon Leader, and No. 7 as the Upper Leader. The pebbles in these are somewhat smaller than those of Nos. 3 and 4; they are usually thin bodies, 1 to 3 inches, but the Carbon Leader is often very rich in gold.

In some mines all of these leaders are present as distinct bodies, and all of them are at present mined wherever their gold values are high enough to give payable results over stoping widths. In all of them there is found a fair number of the bright glassy black pebbles well represented in the Van Ryn specimens presented. In some mines, as in places in the Government Areas Mine, for instance, all these bodies seem to merge, with but thin intervening bands of quartzite, into one great Reef, which may attain thicknesses, as it does in that mine, up to 11 feet, and very exceptionally up to 15 feet, yielding enormous tonnages of payable ore.

The black glassy quartz pebble above referred to, always plentifully represented in this Reef, is sufficient in itself to distinguish it from the Nigel Reef. In the Nigel this black glassy quartz pebble is either absent altogether or, if present, it occurs so seldom that for practical purposes it is non-existent. There are besides other characteristic pebbles which, everywhere present in the Van Ryn Reef, are either absent or extremely scarce in the Nigel. Among these distinctive pebbles, including the black glassy quartz pebbles referred to, may be mentioned the following:—

1. The black glassy quartz pebble aforementioned.
2. A grey quartz porphyry pebble.
3. A greenish grey striped fine-grained quartzite pebble. (See specimens from Government Area and Southern Van Ryn Mines.
4. A yellowish brown, fine-grained quartzite pebble. (See specimens from New Modder and Southern Van Ryn Mines.)

These are the more conspicuous pebbles occurring in the Van Ryn serving to differentiate that Reef from the Nigel.

In addition to these differences in the individual pebbles, observers will note that the matrix of the Van Ryn is different from that of the Nigel, which in the pyritic ore is generally much darker in colour and different in character. It may be recalled, too, as stated in the description of the Nigel Reef, that the gold of the Van Ryn is bright yellow and flakey, and not dull and fine as in the Nigel.

In the Van Ryn, as in the Nigel, the gold chiefly occurs in distinct shoots of payable ore, which may constitute from 50%, to 80% as in the New Modder, of the total Reef areas of the mines in which it has been opened up by extensive development. On the mines working this Reef on the Far East Rand the stoping widths of these pay shoots average 65 inches. The pay tonnages vary from about 10,000 tons per claim in mines like Geduld and Springs to as much as 70,000 tons per claim in the Van Ryn Estate. The specimens presented show the chief characteristics, which are very clearly seen when the unoxidized specimens are dipped in water. The specimens represent the Reef from mines and outcrops covering a length of country of over 40 miles, and serve to show how persistently the Van Ryn Reef Series maintains its character in appearance

and material over that extensive area. See the very striking identity of character in the specimens of Van Ryn Reef proper and Upper Van Ryn Reef from Van Ryn Estates and New Modder Outcrop and the specimens of the same Reef bodies from Klippoortje (Houtpoort, Ltd.) and the Heidelberg Townlands (Eastern Van Ryn and Modderfontein Gold Reefs, Ltd.).

The Van Ryn Reef Series is identified with the Bothas and Randfontein Series of Krugersdorp, that is, quite distinct and much older than the Main Reef Series of the Central Rand, which lies about 6,000 to 7,000 feet higher in the Witwatersrand System.

(*Specimens 14 to 31, 36 to 59, 64 to 65, photographs 2, 4, 5, 6, 7, 8.*)

Note on the Buckshot and Carbon Leader of the Van Ryn Reef Series.

A.—The Buckshot Leader is a leader well developed in the mine of the New Rietfontein Estate. It is identified as the B. Leader (No. 4) of the Van Ryn Estate and New Modder Mines, and recently I have found it in the streets of the Troyeville suburb of Johannesburg. (See specimens presented.)

B.—The Carbon Leader, New Rietfontein, that is, the same as the Carbon Leader (No. 6) of Van Ryn Estate and New Modder Mines, has been located by our recent prospecting work on Heidelberg Townlands. (See specimens presented, *Nos. 54* to *57*.)

These specimens of the Buckshot and Carbon Leaders from places far apart show the persistence of character of even the minor bodies or leaders of the Van Ryn Series over great distances.

4.—Far East Rand Kimberley Reefs.

These Reefs are identified with the South Rietfontein or Langermann's Kop Reefs of the Central Rand, and with the Battery Series of Krugersdorp, that is, distinct from and much older than the Kimberley Series of the Central Rand, which lies 6,000 to 7,000 feet higher in the Witwatersrand System.

The lowest of these Reefs lies about 250 feet above the shale bed known on the Far East Rand as the Kimberley shale. That is the fourth and uppermost shale bed referred to in these notes. This is the shale bed which is sunk through in the vertical shafts of all the deeper mines of the Far East Rand which are put down to the Van Ryn Reef below.

The lowest Reef of this very large series of Reefs is usually a great body of banket, sometimes attaining 20 to 30 feet in thickness. It has the outstanding characteristic of being made up almost wholly of white vein quartz pebbles of large, sometimes almost giant, size. Round the pebbles there is usually a covering of dark material, conspicuous in the unoxidized specimens presented when dipped in water. There is no other Reef in the whole Witwatersrand Series which has these very notable and peculiar characteristics. The specimens presented are from Langermann's Kop (outcrop specimens), Brakpan No. 2 shaft and Sub Nigel New Vertical shaft. These serve to show in this Reef, as in others, the persistence of individual character of the Reef over great distances. (*Specimen 32 to 35, photograph 1.*)

The Molyneux Reef is the Reef which was exploited by numerous companies twenty years ago under the mistaken idea that it was the extension southward of the Nigel Reef; consequently it is the Reef which in these Southern Areas has been and is identified by Dr. Mellor and others as "the Main Reef Leader." Observers will note that it bears no resemblance whatever to the Main Reef Leader, specimens of which from the Geldenhuis Mine and Leeupoort adjoining the East Rand Proprietary Mines, are included for comparison.

The Molyneux Reef has been found to be unpayable in every mine where it has been opened up, and hundreds of thousands of pounds have been mistakenly expended on this useless work.

The Nigel Reef is the Reef that has been mined in the following properties:—

The Nigel,
The Sub Nigel,
The Nigel Van Ryn,
Daggafontein.

Note.—The Southern Van Ryn will also mine the Nigel Reef as well as the Van Ryn.

Note.—The Daggafontein No. 7 borehole and the No. 1 shaft passed through the Van Ryn Reef at the depth of 2,100 feet, assaying 18 dwts. over 7 inches, but the Reef was wrongly identified as the Kimberley, and the shaft was carried down 1,500 feet below to the Nigel Reef, which is the Reef now being developed, the Van Ryn Reef being left so far untouched. Had the Van Ryn Reef been developed on this mine from the first, the mine would have reached the producing stage possibly 10 years ago, and the company would have saved hundreds of thousands of pounds.

The Van Ryn Reef is that mined on the

New Kleinfontein,
Van Ryn Estates,
Van Ryn Deep,
New Modder,
Modder B.,
Modder Deep,
Geduld,
Government Areas, Modderfontein,
Brakpan,
Springs,

and is the Reef that is now being opened up on

Modder East (outcrop),
The New State Mines (deep level),
Springs West (deep level),
Southern Van Ryn (outcrop),
Lace Proprietary (deep level),
Spaarwater (deep level),
Houtpoort, Limited, Klippoortje (outcrop),

Eastern Van Ryn and Modderfontein G.R., Ltd., Heidelberg Townlands (outcrop).
Boschfontein Gold Mines (outcrop).
Boschhoek Proprietary (outcrop).
Eendracht (deep level, Van Ryn Reef at 2,625-2,630 feet).
Far East Rand Mines South (outcrop).
Roper River (Schikfontein, etc.).
Lomah Banket (Sterkfontein).
Far East Rand Mines Selection South (Wilgepoort) (outcrop).
Modderfontein-Van Ryn South (Modderfontein 56, Malanskraal 71).
Malanskraal (outcrop).
Rooiwal (outcrop).
Abbeville G.M. Co., Ltd. (Driefontein 280, Schikfontein, Kaffirskraal).

The Modder East contains the Van Ryn Reef in the Southern portion of the property, where it is at present being developed, but on the Rand Klip portions of the property only the Nigel and possibly the Molyneux Reef have been disclosed in the shafts and there is strong reason for thinking that the Van Ryn Reef does not extend over that Northern portion of the Modder East.

The Van Ryn Reef is the same as the Botha's and Randfontein Reefs of the West Rand, and has been mined by the companies working there for the past 30 years. See specimens of Upper Van Ryn Reef (egg-shaped pebble reef) from Humphreys' claims, Krugersdorp.

The Far East Rand Kimberley Reef.—This Reef is known on the West Rand as the Battery Reef, where it contains pay shoots which are mined.

Main Reef Leader.—Note the marked difference between the specimens of this Reef—one of the seven Reefs forming the Main Reef Series—and the specimen of the solitary Blue Sky Reef, which rests on its footwall of shale. Note, too, the rough exterior of the pebbles of the Main Reef Leader in contrast with the smooth and polished exterior of the quartz pebbles in the Van Ryn. (*Specimens 62 to 63.*)

Blue Sky Reef and Blue Sky Shale.—Specimens of this Reef and its shale are included in the collection to show the difference between this unpayable Reef and the Main Reef Leader of the Main Reef Series. I know of no shale like the Blue Sky shale in the Main Reef Series. (*Specimens 60 to 61.*)

STRATIGRAPHY AND DEPOSITION OF THE REEFS.

In Geikie's Text Book of Geology, it is laid down that in default of distinctive fossils in sedimentary formations, the best means of correlation of any given bed and of distinguishing between one bed and another from area to area is to take note of the character of the material of which each of the beds is made up. If a bed is found to retain any distinctive material from area to area and to differ in such distinctive material from other beds which lie above or below it, that fact is evidence of continuity of such a bed and of its separate identity apart from the others not containing its distinctive material.

I submit that the specimens of the various Reefs in this collection present the most complete evidence not only that each of these pebble beds referred to

under the several Reef names does retain distinctive material peculiar to itself over great distances, and that each one of them differs in appearance and in material from each of the others. Especially is this so in the lowest of the Far East Rand Kimberley Reefs, the Van Ryn and Nigel Reefs, and the Molyneux.

The reading of the stratigraphy of the Witwatersrand System and of the Far East Rand Beds in particular, which for some years I have put forward in many papers, reports and maps, is based on this method of close examination of the material of which the "Reefs" are composed, and when I say that the Nigel Reef is materially the Nigel Reef wherever found, and that the Van Ryn Reef is materially the Van Ryn Reef wherever found, and that the Nigel is materially different throughout from the Van Ryn, I am giving expression to the results obtained after prolonged examination and research.

The evidence of this, which the specimens to some extent will serve to represent is open to all in the field to see and check. The difficulty is that our Engineers and Geologists of the "One Reef" School so far refuse to make the necessary examination. The work of Mr. Pirow, the Research Scholar on Rand Reefs, who contributed specimen No. 55 to the collection, will be the first systematic work on this subject outside of my own.

The old reading of Rand Stratigraphy is based (1) on the assumption that any given bed (Banket Reef) varies in its material from stope to stope, from mine to mine, and from area to area, and (2), so far as the Far East Rand is concerned, on the assumption that certain sills of intrusive diabase, sometimes amygdaloidal, are contemporaneous flows interbedded between the strata. On this assumption the diabase sills are taken as markers of the position of the beds above and below.

In regard to No. 1, I can only say that the assumption is an erroneous one, and that it has led to the loss of several millions of money to those who bought shares in mines like the East Rand Proprietary Mines, where the Blue Sky Reef, although totally different in material and bedding, has been followed as the extension of the Main Reef Leader.

As I stated at the last annual meeting of the East Rand Proprietary Mines, the Main Reef Series, that is the whole series—not a single Banket bed like the Blue Sky, but the series comprising the North Reef, Main Reef, Main Reef Leader, Middle Reefs, South Reef Leader and South Reef—is outcropping on Leeuwpoort, south-east of Boksburg; the line of outcrop can be located for a length of strike of about five miles. The Main Reef Leader carries payable values at the Old Leeuwpoort G.M. Co.'s working, and the South Reef Leader shows visible gold. There exists, therefore, an outcrop extension of the Main Reef Series immediately available for mining as soon as the technical advisers of the Houses concerned give up the erroneous identification of the Blue Sky Reef as the Main Reef Leader and their futile attempts to mine it.

Regarding assumption No. 2, the danger of relying on igneous rocks as markers for sedimentary beds is referred to in most text books. I will only say that the records of the Government Area's (Modderfontein) shaft sections clearly show that the diabases of the Far East Rand, taken by our geologists for contemporaneous flows, are certainly intrusive. They cut across the bedding

planes of the quartzites and Bankets and are seldom found to coincide in position from one shaft to another. In some sections there is only one sheet—in others 2, 3 or even 4. These diabases are, therefore, worse than useless as markers. Besides Hatch and Corstorphine ("Geology of South Africa," page 140) show in their section through Grootvlei to Palmietkuil, east of Springs, three different occurrences of amygdaloidal diabase at widely separated positions in the section. In country 20 miles to the south, as at Heidelberg, how is the diabase occurring in the section overlying the Molyneux Reef there to be identified as the representative of any particular one of the three amygdaloidal diabases shown by Hatch and Corstorphine.*

This assumption (No. 2) has also caused great loss to those who provided the money to develop the Molyneux Reef in the Heidelberg area, where, like the Blue Sky at Boksburg, although quite different in material and bedding, it has been identified as the true extension of the "Main Reef Leader." This erroneous identification of a Banket Reef based on the uncertain and probably equally erroneous identification of a diabase has prevented the opening of the true extension southwards of the Nigel and Van Ryn Reefs, and delayed the mining development of the Heidelberg district for nearly 30 years.

Considering the great areas covered by these pebble beds, it is inconceivable by me that they could have been laid down except by distributing waters acting over wide areas and on a grand scale. It is obvious that under such conditions changes of material in one bed from place to place are not to be expected, and the evidence of the Reefs themselves shows clearly that such changes do not in fact occur. Reasoning from the continuity of distinctive character of each of the Reefs named, I conclude that they are the resultant pebbly strata laid down by ocean currents acting at widely separated periods of time on successive accumulations of shore deposits, each of which, while containing certain rock constituents common to them all, also contained in each case certain others which were peculiar to the particular accumulation from which each resultant Reef was derived.

The old and, I submit, erroneous method of identification of the Reefs is based on any Reef in a given area being identified simply from its position relative to the position of a basic igneous rock (amygdaloidal diabase), itself of doubtful identity. The present and, I submit, true identification of the Reefs is based on the material of the Reefs themselves and their stratigraphical positions relative to one another.

The lower Witwatersrand beds, lying below the Reef Series identified as the continuation of the Van Ryn Reef Series in the Nigel-Heidelberg area, through Tulipvale, Klippoortje (Houtpoort, Ltd.), Heidelberg Townlands (Eastern Van Ryn and Modderfontein Gold Reef, Ltd.), Boschfontein, Boschhoek and Eendracht, are fully exposed for two miles back in the section where the

**Futility of diabase as marker.*—The Nigel Company put down three boreholes in the beds underlying the Nigel Reef on their property. Nos. 1 and 2 were on the werf claims; No. 3 was on Bultfontein, behind the Rand Nigel. Both 1 and 2 met diabase 500 to 800 feet thick (No. 1 from 509 feet to 1,292 feet, and No. 2 from 441 feet to 926 feet). The diabase in No. 2 is described as amygdaloidal. No. 3 shows no diabase until 1,854 feet. If the amygdaloidal diabase in No. 2 borehole were used as a marker for the "Main Reef Leader," as is the practice of the "One Reef" theorists, the Nigel Reef (*i.e.*, the so-called "Main Reef Leader") should be found in the No. 2 borehole at about 1,500 feet *below itself!* The records of the boreholes were kindly lent me by the Board of the Company.

sequence of these beds is shown in detail on Map No. 2 issued with this book. It is a fact that there is no reef nor series of reefs in these underlying beds which can in any way be compared or identified with the Van Ryn Reef. This fact taken together with the absolute agreement in detail, including its gold-bearing character, makes the identification of the reef in question, now for the first time, being opened up and mined in that area, as the Van Ryn Reef certain and beyond question.

ECONOMIC IMPORTANCE OF CORRECT IDENTIFICATION OF THE REEFS.

The respective profit earning values of the Main Reef Series of the Central Rand and of the Van Ryn Reef of the Far East Rand can be appraised by a study of the following statements recently written and compiled by Mr. H. S. Denny, formerly Consulting Engineer to the Albu group of mines :—

"*Success of the Van Ryn Gold Mines Estates.*—The reorganisation of the Van Ryn Gold Mines Estates Co. under new technical and financial control, begun just before the Boer War and systematically followed up after the war, led to a remarkable change in the fortunes of that particular company and altered the whole aspect of the future of the Far East Rand area.

"The success of the Van Ryn Company was due partly to better administration, but mainly to the development of a series of ore bodies overlying what had been regarded, up to that time, as the main ore body. The general character and occurrence of these overlying series differed from that of the Central Rand in several notable features, a fact which had not been recognised under the previous administration.

"*Far East Rand 1903 Returns.*—In 1903, the returns from the whole of this Far Eastern Section totalled £162,037, this output representing the result of work of four companies.

"In 1905, the returns had improved to £1,013,889, and in 1918, the returns, as shown in the following statements, had risen to £11,507,399.

"Statement 'A' gives some of the salient features of the ten companies of the Far East Rand.

STATEMENT A.

STATISTICS OF COMPANIES PRODUCING FROM THE VAN RYN REEF.

EXTRACTED FROM ACCOUNTS AND REPORTS OF LAST FINANCIAL YEAR, *i.e.*, 1918.

Company.	Date of Reg'n.	Issued Capital.	Claim Area.	Mine Profits.	Taxes Paid Union Government.	Dividends Paid.	Tonnage.	Ore Reserves. Value in dwts.	Width in inches.
		£		£	£				
Govt. G. M. Areas ...	1910	1,400,000	2632.2	876,326	380,714	27½%	9,445,000	8.	78.
New Modderfontein ...	1888	1,400,000	1300.8	833,263	109,974	40.5 8%	9,000,000	8.6	65.
Modder "B"	1908	700,000	1467.0	658,586	117,129	82½%	3,378,000	9.2	—
Van Ryn Deep	1902	1,196,892	768.0	617,084	88,042	45%	2,445,759	9.	70.
Modder Deep	1899	500,000	377.5	593,851	79,124	97½%	3,450,000	8.8	78.
Springs Mines	1909	1,153,500	3567.0	423,695	62,343	22½%	2,368,000	9.3	61.
Brakpan Mines	1903	791,100	3386.0	355,797	61,244	32½%	2,718,000	8.7	68.
Geduld Prop.	1899	1,008,281	2481.0	234,241	14,696	5%	2,510,000	7.5	61.
Van Ryn	1894	500,000	158.0	116,100	12,382	17½%	1,347,916	5.6	52.
New Kleinfontein ..	1894	1,326,540	1805.0	49,828	—	Nil.	2,595,000	5.41	58.8
		£9,976,313	17942.5	£4.758,771	£925,648	37.5	39,257,675	8.01	65.75

"Statement 'B' gives a comparison of the results between the Central Rand, and the Far East Rand.

STATEMENT B.

	Central Rand.	*Far East Rand.	†Total.
Total tons crushed	18,561,825	6,360,938	24,922,763
Percentage	74·47%	35·53%	
Gross value	£23,315,618	£11,507,399	£34,823,017
Percentage	66·96%	33·04%	
Gross profit	£3,632,217	£4,868,053	£7,500,270
Percentage	35·09	64·91	
Dividends	£1,742,557	£3,401,520	£5,144,088
Percentage	33·88	66·12	

"(*) Figures taken from Companies' reports and dividend announcements.

"(†) The provisional figures issued by the Transvaal Chamber of Mines.

"The figures in Statement 'B' reflect the percentage for which the Central Rand and the Far East Rand respectively are responsible, and it is important to note that there are only ten companies in the Far East Rand Section against 38 in the Central Rand Section. The value of the total production of the Far East Rand Section up to the end of 1918 is approximately £70,000,000.

"The following are the important features shown in the above statements:—

"(1) The total ore reserves of the ten Far East Rand companies, viz., 39,257,675 tons, are equivalent to over 2,000 tons of payable ore developed per claim, for the whole developed and undeveloped area represented.

"(2) The ultimate average tonnage of payable ore per claim is estimated to be from 10,000 to 30,000 tons.

"(3) The average width of the ore bodies mined is approximately 5 feet, and the average value on that width over 30s. per ton.

"(4) The average dividend paid on the issued capital of the companies for the financial year ended in 1918 is 37 per cent.

"The total ore reserves of the Witwatersrand up to the end of the year 1918 are stated as approximately 90,000,000 tons, and of this total the ten mines of the Far East Rand are credited with no less than 43 per cent.

"In comparison, therefore, with the mines of the rest of the field, those of the Far East Rand show greater width of ore body and greater average value per ton, whilst the average ore reserves are much larger. The Government Gold Mining Areas and the Modderfontein Gold Mining Company together, jointly hold over 20 per cent. of the total ore reserves of the field.

"*Special features of the Far East Rand.*—The first conspicuous feature of difference between the Far East Rand and the Central Rand, is the flatness of the formation; the second,—the logical result of the first—is the extraordinary distance from the outcrop at which these ore bodies are being worked (over

seven miles in some cases); the third is the distribution of the gold in certain well-defined areas or lenticles, some of which are as much as 4,000 feet long, up to 1,000 feet wide; and the fourth is the high average width and value of the ore bodies.

"In the earlier stages of the development, the flatness was held to be a bad feature, because of the smaller tonnage per claim, and it was thought that mining would be more difficult and expensive, but as against this, there is the other compensating factor of a vastly greater tonnage lying at workable depth. In other words on the Far Eastern Rand the reefs are workable for a distance of many miles on the incline across the shallow synclinal basin because the formation flattens, whereas on the Central Rand, owing to the high angle of dip the limit of practical work has been reached within three miles of the outcrop.

"*New Modderfontein Company.*—A few facts about some of the mines in the list may be of interest. The New Modderfontein Company owns 1,255 claims. Of this number 241 have been worked out and are exhausted. A further 289 have been fully developed and contain ore reserves amounting to nine million tons. About 100 claims have been proved unpayable and there are other 600 virgin claims. It is expected that the total tonnage of payable ore on this property will prove to be about 30 million tons. The gross value of the present nine million tons of ore reserves is calculated to be £20,000,000, estimated to yield over £10,000,000 in profits. These figures are based on last year's actual milling of 684,100 tons, giving gross revenue of £1,559,178, and a profit of £838,264. The yield averages 45s. 7d. per ton; the working cost 21s. 3d. per ton; and the profit 24s. 4d. per ton.

"*Government Gold Mining Areas.*—Another instance may be taken in the Government Gold Mining Areas. The ore reserves amount to 9,450,000 tons, worth 36s. per ton, and roughly the value of the mine is estimated at between £70,000,000 and £80,000,000, and the profit value between £35,000,000 and £40,000,000.

"*Early doubt regarding Far East Rand.*—Before the Van Ryn Company had entered on its successful career, there was a good deal of enquiry into the possibilities of the continuation of the ore bodies eastward and southward, and at that time all kinds of doubt as to the possibility of finding payable ore on the projection were expressed, and the concensus of opinion was certainly pessimistic.

"*To-day's confidence in results.*—The first borehole results at Brakpan and Geduld, coupled with disappointing prospecting work at surface on other properties in the district, seemed to warrant this pessimism, for, as recently as 1905 no one had any conception of the extraordinary results which were to be realised from the Van Ryn and Modder Mines. To-day, however, nobody is surprised to learn that big financial houses have committed themselves to expenditure, running into millions, on properties in this area on which no development had previously been done, as in the case of West Springs Mines, a property leased from the Government in 1918 by the Anglo-American Corporation; and also in the case of the New State Areas taken by Messrs. Barnato Bros. In fact, the borehole is being dispensed with in certain regions for the reason that boreholes are inconclusive from the value standpoint, and are unnecessary where the continuity of the ore bodies is fully established by neighbouring developments.

"*The Government's attitude.*—The Government, on the advice of various mining experts, gradually became alive to the value of its holdings in this district, and to illustrate the faith that the financial houses have in the unproved potentialities of these ore bodies, it may be mentioned that for the lease of the West Springs area of 2,000 claims from the Government, the lessees have undertaken to provide £1,400,000 working capital, and in addition, to hand over to the Government 53 per cent. of the working profits.

"The Barnato group is one of the strongest, if not the strongest and most successful of the financial houses on the fields, and it is interesting to follow its operations in the past few years. In the year 1902, it acquired the Van Ryn Deep; in 1910, it tendered for and secured the Government Gold Mining Company's area; early in 1918 the New State Areas; and later it acquired the Cassel Colliery and Clydesdale Colliery, the Lace Proprietary interest in the Farm Vlakfontein (No. 26), and finally the farm Spaarwater. These transactions have, step by step, extended Messrs. Barnato's operations southwards, round the contour of the formation, from the northern to the southern limit of the syncline. A few years ago, the suggestion to undertake an initial commitment of hundreds of thousands for shaft sinking and development on the farm Spaarwater, with only the result of one borehole, which gave a 2 pennyweight value, as direct evidence of the existence and value of the ore bodies on the property, would have been ridiculed. To-day, the fact that the house of Barnato shold be responsible for such a step, excites no adverse comment, and is accepted by the most conservative and pessimistic, as an indication, not previously realised, that there are, at least, possibilities of further extension of the big mines southwards."

THE ECONOMIC IMPORTANCE OF CORRECT IDENTIFICATION LIES IN:—

1. The established unpayability of the Blue Sky and Molyneux Reefs, which, under the old method, have both been identified erroneously with the Main Reef Leader, and the enormous losses caused thereby to the shareholders of the companies which have attempted to work them because of that erroneous identification.

2. The established inferiority of the Nigel Reef to the Van Ryn as a producer of the large tonnages of pay ore required on any large scale of work and capitalization such as is usual on Van Ryn Reef mines. Delay caused in reaching the producing stage on this deeper and thinner reef and possible eventual actual loss through the smaller pay tonnages of the Nigel Reef (4,000 to 5,000 tons per claim) being insufficient to support the heavy capitalization of the deep mines where it is being developed at depths of over 3,500 feet on the erroneous identification of the Reef as the Van Ryn. The error is the more unfortunate where, as in the case on the Daggafontein and other mines, the Van Ryn Reef is present, and might have been supplying its great tonnages years ago.

3. The established payability of the Van Ryn Reef throughout 50% to 80% of its area yielding pay tonnages of 10,000 to 30,000 tons per claim (the 70,000 tons for the Van Ryn Mine being exceptional) in all the mines on the Far East Rand where it has been opened up on a sufficiently extensive scale, and

this over an area of about 60 square miles: the established character of the reef both as to its geological nature and its gold values giving strong assurance of similar results being obtained when similar sufficiently extensive development is done on the same Reef in the southern portion of the great synclinal area which contains it—that is in the Nigel-Heidelberg district—and the same assurance holds good for the extensions of the Reef in the detached syncline—Malanskraal-Greylingstad.

4. The established payability of the Nigel Reef throughout about 33% of its area (but with much smaller pay tonnages in the pay shoots than the similar pay shoots of the Van Ryn) in all the mines where it has been opened up on a sufficiently extensive scale, giving strong assurance of payability for its outcrop mines and valuable accessory tonnages to the Van Ryn, where its deeper levels lie below the outcrop areas of that reef.

5. The maintenance of the gold values in depth in the Van Ryn and Nigel Reefs in contra-distinction to the impoverishment in depth of the Main Reef Leader of the Central Rand, as shown in nearly all the Deep Level mines from Boksburg to Roodepoort. The Van Ryn Reef has been proved to be payable as far in as seven miles from the outcrop, while the deep levels of the Main Reef series have brought about the present *low grade mines* crisis now being inquired into by a Government Commission. This impoverishment in depth of the Main Reef Series has caused losses of millions of money to investors who bought at top prices into mines like Village Deep, Crown Mines, E.R.P.M. and many others. While investors who have bought into the Van Ryn Reef mines of the Far East Rand in the early stages of these mines have invariably made large profits and are now earning big dividends. Besides impoverishment of the reef in depth these Central Rand deep level mines suffer from high temperatures, insufficient ventilation, crush strains on the foot walls and hanging walls of the drives and stopes and other disabilities, making mining costly, unhealthy, and even dangerous. There is in consequence a tendency for the technical men, the white miners and also for the native workers on these deep and unprofitable mines to quit them whenever they can and look for work on mines nearer the surface, where the conditions are more healthy and congenial.

Investors are beginning to realise the folly of following the financial lead and technical policy of mining houses, which has resulted in millions of their money being swallowed up by purchases at inflated prices of shares in these mines of the Central Rand where the reefs must be mined at depths of from 3,000 to 7,000 feet only to make a narrow marginal profit and in many cases actually a monthly loss. They are beginning to consider the infinitely more attractive and more certainly profitable opportunities offered by the New Outcrop areas of the Southern Far East Rand where both the Van Ryn and Nigel Reefs have been located and opened up from the surface. They can purchase shares in companies like Southern Van Ryn, Nigel Van Ryn, Roodeklip, Houtpoort Ltd., Eastern Van Ryn and Modderfontein Gold Reef Ltd., Far East Rand Mines South, Boschfontein Gold Mines, Abbeville, Roper Rivers, Lomah Banket, Modderfontein-Van Ryn South, and others holding large areas on these profit-earning reefs at ground floor prices or about one-fifth to one-tenth of what they have been used to pay for shares in these disappointing deep deeps of the Central Rand sold to them at inflated premiums of from 300 to as much as 1,000 per cent.

They are also beginning to realise :—

(1) That these outcrop area mines can be brought to the producing and profit earning stage by the expenditure of from 1/5 to 1/4 of the Capital required by the deep levels and within one-quarter of the time ;

(2) that the working costs will be lower on these mines than on the deep levels by from 5/- to 7/6 per ton ;

(3) that unlike companies holding ground under Government lease whereby one-quarter to more than half of the profits go to the Government, the companies named above retain all the profits with the exception of the ordinary 10% profits tax ;

(4) that as phthisis will be practically non-existent from the beginning on these mines the heavy charges for compensation required under recent legislation will not have to be paid by them.

Appended is a numbered list of the specimens exhibited before the Technical Staffs of the Government Departments, the Mining Houses, and the Mines and others interested in mining in Johannesburg before their dispatch to England. (See *Appendices.*)

NOTES ON SECTION THROUGH SPRINGS MINES TO DAGGAFONTEIN No. 1 SHAFT AND No. 7 BOREHOLE.

The Far East Rand Kimberley Reefs are mostly large pebble Reefs, some of great thickness, up to 26 feet, and the lowest Reef of the series is about 150 to 250 feet from the Far East Rand Kimberley (S. Rietfontein) shales. This series has been intersected in all the boreholes and shafts on the Far East Rand, which have struck the Van Ryn Reef at 2,500 or deeper.

The Van Ryn Reef lies at the base of a quartzite formation containing only small pebble Bankets, the Chimes series and some stringers. The Van Ryn Reef lies near or on the Van Ryn Footwall shales.

The Nigel Reef lies at the next shale contact, about 600 feet below the base of the Van Ryn shales, that is, disregarding intrusive sills of igneous matter.

The plane of the Van Ryn Reef at Springs Mines, as shown in the eastern drives of that mine, is rising at nine degrees to the south or south-east. Assuming, however, an average rise of only five degrees from the end of Springs Mines South Incline to No. 7 Borehole, near the No. 1 Shaft, Daggafontein, the rise in that distance would be 1,846 feet (the distance between No. 7 Borehole, Daggafontein, and the end of Springs Mines south Incline is approximately four miles). The Reef at the contact of the upper

shale in that Borehole, No. 7, Daggafontein—the Van Ryn Reef—was struck at 2,102 feet. Adding to 2,102 the 1,846, which at 5 degrees inclination and four miles on the dip would be the additional vertical depth of the Reef, we have 3,948 feet, or very nearly what is known to be the depth at the end of the South Incline in Springs Mines, that is near the position of the No. 3 Shaft, and at that position the Nigel Reef, now being developed in Daggafontein Mine, would be found about 1,500 feet lower, or at a depth of, say, 5,350 to 5,500 feet.

The sections show, that the sub-outcrops of the Far East Rand Kimberley beds come to the sub-surface below the dolomite west of the position of the No. 7 Borehole, Daggafontein. That is to say, these beds were eroded in this eastern area of Daggafontein before the deposition of the dolomite.

The reef at 2,102 feet in No. 7 Borehole, Daggafontein (the Van Ryn Reef) lies at the contact of the important shale bed lying below (the Van Ryn Shale). At the contact of the Far East Rand Kimberley beds with their underlying shales no such reef has ever been found in any of the numerous shafts and boreholes which have been put down on the Far East Rand through these beds to the Van Ryn Reef.

The Reef (Van Ryn) at 2,102 feet in the No. 7 Borehole, Daggafontein, assayed 18 dwts. over 7 inches.

At 3,561 feet in No. 7 Borehole, Daggafontein, another reef was struck, also at the contact with an underlying shale. This Reef (the Nigel) assayed 24 dwts. over 6 inches, and is now being developed in the Daggafontein Mine.

This Reef is identical in its material—pebbles, matrix and gold—with the Nigel Reef, mined in the Nigel and Sub Nigel Mines, and recently opened in the Southern Van Ryn and Nigel Van Ryn Mines, and is quite dissimilar to the Van Ryn Reef mined in Springs Mines, Government Areas, Brakpan, Van Ryn Deep, New Modder, Modder B, and the other mines on the Van Ryn Reef of the Far East Rand.

The Van Ryn Reef mined in these mines is, however, identical in its material—pebbles, matrix, etc.—with the Reef which lies above the Nigel Reef in the following mines :—

At a depth of	2,102	feet,	Daggafontein	Borehole	No.	7.
,, ,,	,,	,,	995	,,	Southern	Van	Ryn	Borehole	7.
,, ,,	,,	,,	627	,,	,,	,,	,,	,,	1.
,, ,,	,,	,,	217	,,	,,	,,	,,	H.E.	Shaft.

Also where it outcrops on the Sub Nigel and further south, where it outcrops on Tulipvale, and the Townlands of Heidelberg, where it outcrops on Malanskraal, Wilgepoort, Daspoort and Rooiwal in the south-eastern outlying synclinal area containing the beds of the Far East Rand.

These facts clearly show that the Far East Rand and its extensions contain two payable gold-bearing reefs, viz., the Van Ryn and the Nigel; the upper, that is the Van Ryn, lying at from 1,100 to 1,400 feet above the lower, that is the Nigel.

Johannesburg,
July 30th, 1918.

NOTE ON THE GEOLOGY OF THE EAST RAND PROPRIETARY MINE.

Accompanying this book is a plan of the E.R.P.M. Mine, with sections of the Reefs and strata exposed by boreholes and shafts. This plan has been reproduced chiefly from data supplied by the Company to shareholders in earlier days.

It will be seen on reference to this plan that all the sections west of a point on the Cason Mine show normal Main Reef Series (several reefs marked in red), with the North Reef of that series north of the East Rand dyke (see section I have prepared and placed above section Q.Q. on the plan) and all the reefs are interbedded in a quartzite formation—Sections A. to P. East of that point on the Cason Mine none of the sections show Main Reef Series, but they all show beds lower than Main Reef Series, that is, the beds of the Blue Sky Reef, with its accompanying shale formation.

In section Q. Q. a dyke is shown, and the Livingstone beds, which overlie the Main Reef Series, are present above the dyke, but the Main Reef Series is missing. Below the dyke there are the shale beds of the Blue Sky formation.

I suggest that the dyke shown in section Q. Q. represents a normal fault, and that by following down on the plane of the dyke the Main Reef Series would be encountered in its normal position below the Livingstone, as illustrated in the sectional Diagram I have prepared and placed just over section Q. on the plan.

If this reading were tested (it could be done at little expense) and the Main Reef Series were found in the position indicated in the section, it could probably be found lying unworked over a considerable area of that portion of the E.R.P.M. which lies on the down throw or south-western side of the fault zone.

On the north-eastern side of the fault zone, the upthrow side, the Main Reef Series is to be seen outcropping with its full number of Reefs exposed in the old workings on Leeuwpoort, including the North Reef, Main Reef, Main Reef Leader, Middle Reefs, South Reef Leader and South Reef, each with its distinctive character and in normal order and sequence. On the old ore dump of the old Leeuwpoort G.M. Co., now included in the Cinderella Deep Mine, normal Main Reef Leader ore can be picked out carrying up to 18 dwts. of gold per ton. I mentioned some of these facts at the last annual meeting of the E.R.P.M. on the 30th May of this year.

In the area to the north-east of the E.R.P.M. Mine, shown on the plan, there is shown the position in plan and section of certain reefs existing there.

The most northerly of these—the Nigel Reef—was opened (on Klipfontein) in prospecting work done under my direction in the years 1910-1911. The reef, which was exposed in a number of incline shafts along a distance of strike of about half a mile, has all the characteristics, in pebbles, matrix and bedding, of the Nigel Reef, and I have no hesitation in stating it as a fact that this outcrop is the outcrop of the Nigel Reef on the northern side of the Main Witwatersrand Syncline, just as the outcrop at the Nigel Mine is the outcrop of the Nigel Reef on the south-eastern side of the Syncline. No geologist or mining engineer who has seen this reef on Klipfontein, except Dr. Mellor, has ever disputed that it is the Nigel Reef.

Further south there are other reefs outcropping, disclosed by boreholes. Of these, that found in No. 1 Borehole, marked in pink, from its position relative to the Nigel and with its great width, may be either the Van Ryn Reef or the lowest Reef of the Far East Rand Kimberley or South Rietfontein Series. I have not seen this Reef core, so cannot write of it with certainty. If it should be the lowest bed of the Far East Rand Kimberley Series, the Van Ryn should be found about 1,500 feet below.

It seems that the E.R.P.M. shareholders, before finally deciding to shut down their mine, would do well to see that an endeavour is made to locate the real Main Reef Series in its normal position, below the Livingstone beds in their Cinderella-Blue Sky areas. Also to acquire prospecting options over the claims to the south-east of their property, which contain the Main Reef Series outcropping or close to the surface east of the fault zone. The Main Reef Leader ore on the old Leeuwpoort carries gold values fully warranting the small expenditure involved. It might even be wise to prospect the areas to the north, and north-east, too, by development from the Nigel Reef outcrop on Klipfontein, and boring for the Van Ryn Reef on the De Bell claims, south of that farm.

PART II.

MINES AND SHARE VALUES.

"I mean to say it is not a question of a property worth, say, five millions or ten or even a hundred millions. It is a matter of Hundreds of millions: it is a thing of enormous magnitude."

These are the words used by Sir Robert Kotze, the Government Mining Engineer, when giving evidence on the value of the Far East Rand before the State Mining Commission in 1917. Since these words were used development has been rapid and mines which were then of more or less uncertain value have taken rank among the very greatest mines in the world, notably is this so of that great mine the Government Areas (Modderfontein).

A study of the following estimates of the yield of gold and profit which may be expected from the producing and developing mines will, I think, cause readers to agree with me when I say that had the Government Mining Engineer said a thousand millions or more instead of hundreds of millions he would not have been far wrong; for the mines dealt with represent less than one-fourth of the areas which contain the Van Ryn and Nigel Reefs at workable depth. The summary following the estimates shows that the estimated gold value of the mines dealt with comes to the grand total of £980,000,000, and the profit value to £410,000,000.

Critics may say that to put forward estimates of mines on which little or no development has been done is not justifiable. To these critics I wish to say that I do not ask any one to accept my figures without question. It is right and wise, too, for all, even for those who are optimists to enquire whether the grounds on which such estimates are based are reasonably sure and reliable. I will endeavour, therefore, briefly and I hope convincingly to establish that the estimates are based on solid grounds.

The records of the mines on which the developed ore reserves already amount to some millions of tons afford sufficiently reliable data on which to base a fairly close estimate of what they are likely to produce both in gold and profits and if some of the figures arrived at may appear very high as, for instance, those for the New Modder, Modder B and Government Areas Mines, I can only say that for every mine they have been put down just as they came out after careful and exhaustive consideration of all the factors on which the calculations were based. I feel satisfied that they will be justified by events, and if they may err either way to some slight extent I am hopeful that they will, as a whole, prove trustworthy guides to any one who may use them. It will, no doubt, strike many as remarkable that for some of the mines the present values of the shares calculated on the basis of the profits reckoned on in these estimates and on the basis of return of the capital plus 10 per cent. interest for the lives of the mines agree very closely with the actual present ruling market prices. This agreement clearly proves that if the estimates are not justified neither are the ruling market prices, that is to say that returns in

actual profits must come up to the standard of the estimates or the market prices of the shares are too high. For a few mines including one or two of the richest the estimates indicate that the current market prices are already a little too high. It is consoling to think that although this may be somewhat disconcerting to the holders of these gilt-edged stocks it will afford some gratification to the pessimists and for once I will have provided a cause for grumbling to the optimists.

To turn to the mines on which little or no development has yet been done. I have in the foregoing pages described in detail the two reefs which are mined on the Far East Rand and shown by word and picture how they differ from each other and from all other reefs and I have stated in clear and definite terms that both of these reefs are present throughout the areas on which these mines are situated. The estimate for each mine is based either (1) on the Van Ryn Reef, or (2) on the Nigel Reef, or (3) on both reefs for mines where both occur as outcrops or where the Nigel in its position 1,500 feet below the Van Ryn is not too deep to mine.

The visible facts on which these definite statements are made are open for all to see and check. No one has dared to deny them categorically in the same way as they are here categorically stated. Indeed, one is at a loss to understand why they should ever have been subject to any question at all. It is generally accepted that 1 and 1 make 2 and 2 and 1 make 3, so in like manner when the Nigel Reef is to be seen at position A in a section and the Van Ryn Reef is to be seen 1,500 feet higher at B in the same section, they surely make two and when the Far East Rand Kimberley Reef is also to be seen at position C in the same section—A Reef plus B Reef plus C Reef—there are surely three. That is what is to be seen by anyone who will take the trouble to visit the Sub-Nigel area and see the section there which is shown on the map of the Nigel-Heidelberg district accompanying this volume. And when A Reef remains A Reef and B Reef remains B Reef and C Reef remains C Reef each in its proper order in every section where they are exposed, one would think that the matter was beyond dispute.

I make the statement of the existence of these two Reefs—the Nigel and Van Ryn as a statement not of theory which so many are fond of calling it, but as a statement of visible evident fact. Those who, on account of what they have been told, possibly by the *Financial Times*, and without having any other first-hand knowledge of their own or even any good independent second-hand knowledge may yet refuse to accept this statement—to them I can only earnestly make the request that they read the preface to this book and look into the matter further in the light which they may obtain from it.

To those who accept as a truth the existence of these reefs, I will briefly recall some material facts about the mines which work them. A local writer put the position briefly only the other day as follows :—" That the Far East Rand is beyond question the hope of the Transvaal gold industry for the future goes without saying, and the fact that there are eight rich mines producing now is *only a warranty of what may be expected when the mines at present being developed reach the producing stage.*" What makes the warranty the writer speaks of a reliable warranty is the fact that the eight rich mines he refers to are all working the same reef—the Van Ryn—and the development done on it in them has proved the reef for a length of fifteen miles and a depth of from three to seven. These mines have shown that no matter how

unpromising the early mining results may have been in each mine, whenever and wherever development has been systematically carried out on a sufficient scale, extensive rich areas have invariably been found and this holds good for every mine on which the Van Ryn Reef has so far been opened up.

The reason is that the gold of the Van Ryn Reef lies chiefly in the shoots or areas of enrichment already described in foregoing pages of this book. It is evident that the distributing and classifying currents which laid down the beds washed most of the gold *out of* the intervening poor areas and washed it *into* the areas of enrichment where it *now* lies. It may sound paradoxical, but it is the truth that it is owing to these intervening poor areas that the Far East Rand is the greatest and most reliable gold field ever found. Were the gold evenly distributed a great part of the field would be unpayable. It is the proved constancy of this disposition of its gold that makes mining on the Van Ryn Reef the greatest certainty in mining. Why should the shares of New State Areas be 30s. on a capital of £1,500,000 and with 60 per cent. of the profits going to the Government? or West Springs 25s. on a similar capital and with similar liabilities in regard to profit? Both are merely bare pieces of veld. Not a borehole was ever put into them, nor into the Government Areas Mine adjoining, yet money is provided in millions for these Mines simply on the faith which the known character of the Van Ryn Reef has established. The development in the Modder B mine in its early days happened to have been done on one of the intervening poor areas and 300,000 tons of ore, at first exposed, showed under 3 dwt. value. The mine was closed down and the shares went a begging at a few shillings. The Modder East Mine now being developed was the old Cloverfield, which was also shut down as unpayable. Five Government boreholes put down on the leased area of the Modder East all showed miserably poor and unpayable values—every one under 5 dwts. Now the mine has nearly one million tons of 8 dwts. ore developed, and the capitalisation of the mine at present prices and on the total issue of the authorised capital is over four millions. The Van Ryn Deep contains in its western section extensive poor zones. Geduld began badly. Government Areas, Modderfontein, the greatest gold mine in the world, after the expenditure of a million and a quarter of money, had only 5 dwt. development results to show for it. Brakpan western shaft entered into a poor area right at the beginning, and had the eastern shaft not struck good values the mine would have been shut down. Even the great and rich New Modderfontein Mine had the same early difficulties, and many of us had the opportunity of buying the old £1 shares at 7s. 6d. Just before the great war, 1913, Springs Mines shares were obtainable at 7s. 6d. These facts show that almost every mine of the eight rich mines encountered to begin with one or more of these poor intervening areas and that they only located their rich areas later.

For nearly 20 years this great gold field of the Far East Rand, now the financial mainstay of South Africa, was looked upon with disfavour. I remember, the New Modder being spoken of as a most disappointing mine; and when it was commenced the Springs Mine was looked upon as a wild cat. It was only when development over the whole northern part of the field had been well advanced that the real significance of these poor shoots and these gold shoots occurring in every mine on the Van Ryn Reef was recognised. These areas and the general trend of their gold shoots to the south-east were

studied and eventually understood, with the result that we find the enterprising and far-seeing house of Barnato right down among these very areas, about which the *Financial Times* feels so doubtful and distressed.

Poor shoots and gold shoots occur in the Nigel Reef, too, only the poor shoots cover about two-thirds of the area of its mines and the gold shoots only one-third, as against the one-quarter to one-half of poor shoots and one-half to three-quarters gold shoots in the Van Ryn. The Nigel, too, is thinner, but fortunately the gold shoots are of even higher grade than those of the Van Ryn.

Actual exploration has shown that wherever reasonably large mining areas have been opened up on either reef, they have never failed to disclose sufficient areas of these gold shoots to ensure payability, and when it is remembered that mining operations on one or other of these reefs extend for a distance of nearly fifty miles, that is from Benoni around the Far East Rand to the Sub-Nigel, the reader will begin to understand how broad and sound are the bases of these forecasts.

To take a striking example from the Nigel Reef in the Sub-Nigel mine; the reef does not average more than 8 inches in thickness, its gold shoots do not extend over more than one-third of its area, its pay tonnage per claim is estimated at only 4,000 tons (see estimate); its working costs per ton are now 38s. 9d., and still it makes sufficient profit on a crushing basis of 120,000 tons per annum to pay dividends of 10 per cent. on an issued capital of £625,000. Were the gold not concentrated in the gold shoots, the mine would be quite unpayable. Incidentally this will enable the reader to understand how unreasonable it is to expect payable development to be obtained immediately a mine on such a reef is opened, as the *Financial Times* apparently expects from any mine not controlled by one or other of its selected friends.

From a study of the estimates based on actual development, results obtained in the Nigel Van Ryn and Sub-Nigel mines, and on the actual production of the old Nigel mine itself (roughly, £4,000,000 in gold and £1,000,000 in profits), readers will be able to judge of what can reasonably be expected from this reef in the other properties containing it in this district.

Development on the Van Ryn Reef in this district has only recently been taken in hand, and that only on the properties of Southern Van Ryn, Houtpoort, Ltd., and Eastern Van Ryn and Modderfontein Gold Reefs, Ltd. (Heidelberg Townlands). For this reason, extracts from the official reports of the work done during August on the above properties have been inserted after the respective estimates. These reports show that on all three properties the Van Ryn Reef as it is opened up, is showing similar widths and values to those which it showed at the Van Ryn and New Modder outcrops—that is panning values of 5 dwts. over 40 to 60 inches. Values like these are now the rule in the western and eastern shafts of the Eastern Van Ryn, and the Water shaft and Anderson shaft of Houtpoort, Ltd.

I submit that these results, when considered along with the results obtained in their early stages by the great mines to the north, are sufficient in themselves to warrant the forecasts exhibited in the estimates. But I submit, further, that the known facts of the peculiar concentration and disposition of the gold in the Van Ryn Reef present good grounds for thinking that the moderate estimates for these mines now commencing development on that reef will be realised, and I would like to ask the *Financial Times* what sound reasons it

can bring forward for thinking that they will *not* be realised. It is an ascertained fact that the conditions above described, proved to exist in the Van Ryn Reef in all the mines where it has been worked, have invariably given certain results, and there is the strongest reason for thinking that these conditions are permanent, and are inseparable from this reef wherever it exists, and consequently that the results to be expected from it will not vary to any great extent within the comparatively small part of its original area represented by the whole Far East Rand syncline, from New Modder to Goedverwacthtung.

I would like to ask the *Financial Times* where it would draw the line, at Springs?—or at Spaarwater? If at Springs, all the southern half of the Far East Rand is excluded; if at Spaarwater, it must admit that the Southern Van Ryn comes within the pale, even although the other Heidelberg properties are cast out. But why should the line be drawn at Springs, at Spaarwater, or, indeed, anywhere? Is not the drawing of such a line by any financial writer manifestly absurd? Will a mining engineer draw such a line, or will that even more adventurous man, the geologist, take upon himself to draw such a line excluding any part of these southern areas? I think not. Nor will the development of the southern half of the Far East Rand, a great new goldfield with a potential value of hundreds of millions, be prevented by such writing.

Finally a word to holders and buyers of shares in the Far East Rand. It seems to me that a study of these estimates made with due consideration of the occasional sudden drops to much lower levels of the prices even of some of the best mines must bring home to the reader that it is dangerous to buy in at top prices shares even in the richest mines. These are the prices ruling when the stable sells; estimates such as those presented, doubtless new to most people, are quite familiar to a few; for every mine there is a limit fixed from time to time above which the shares are sold; the limit at which they are bought is another matter.

The history of the market movements of the past ten years shows that those who bought their shares during the early stages of the mines of the Far East Rand now see large profits on their purchases and are drawing princely dividends on the original prices which they paid; while those who waited till the mines were paying dividends besides much smaller returns on their investments in some cases see an actual loss.

The note by Mr. E. E. Bryant, which follows, should be carefully studied, especially the obvious fact so often lost sight of, that each year sees a lessening of value of these shares after a mine has reached the zenith of its production by an amount equal to one year's return of capital and dividends already received by the seller, consequently never to be received by the buyer. A few examples of this as applied to leading mines are given immediately after the estimates. This fact seems to be recognised spasmodically from time to time about every three or four years, and then the shares have a sudden drop, which wipes out the dividends which have been received on them for several years.

The following extract from the evidence of Sir Robert Kotze, the Government Mining Engineer, before the Select Committee of Parliament, 18th February, 1918, will further enlighten the reader:—

"Sir Edgar Walton: (1379.) Supposing it were the policy of the Company to pick the eyes out of the mine for market purposes, have you any means of preventing that?—Sir Robert Kotze: It depends to what extent they do it.

Picking the eyes out of a mine is a very difficult thing to criticise adversely. Many people think that because you work the richer portion of a mine first, it is picking the eyes out of the mine; but it may be an excellent financial policy. Surely nobody with a large amount of profit in sight would work out the less payable portion of the mine first. Of course, you would work the richer portion of the mine first, as far as is consistent with the whole scheme of operations.

(1380.) Yes, but you perceive that the effect of that with the ignorant investor is bound to be very serious?—That is the position with all the mines; they are all worked more or less on that principle.

(1381.) Then the man who invests in a mine that has been worked for a certain period is left in the unfortunate position of nursing an unpayable proposition?—He is not in a worse position than the investor in a mine in which the Government has no interest.

(1382.) Is there no means of protecting the interests of the public in this matter?—As long as the mine is worked efficiently that is a principle that would be followed—that the richer portions of the mine would be more likely to be dealt with in the first ten years of the life of the mine, and after that period the dividends are likely to be lower.

(1383.) How is the ordinary investor to know when the stage is reached? He buys the shares on the basis of the dividend that is being paid and has been paid for several years, perhaps?—*Well then, if he buys on that basis, God help him.*"

How often and with what disastrous loss to the investor has this very thing occurred when he has purchased gilt-edge Corner and Kindred House stocks at top prices is partly revealed in the preface to this book. There only seven mines are dealt with and they show a depreciation of fifty-one millions. Had the full tale been told the depreciation would have come to £100,000,000. How long will the South African, British and French investors who really finance the mines be content to do so only at second, third or fourth-hand by purchasing their shares at dangerously high levels and often at the topmost prices meaning certain profit to the seller and only a bare interest margin and sometimes actual loss to them?

The reader should keep the above remarks by the Government Mining Engineer constantly in mind and should understand that the estimates which follow are based on the present available data, and that they probably mark the maximum which is likely to be produced by any of the mines dealt with, and that they would therefore be adversely affected if any drop in development tonnages and values should occur, or if the mining policy should be flagrantly at fault, of which we have had one notorious example recently. If in future the development returns of any particular mine show marked differences of payable tonnages and values from those calculated in the estimates, then the reader should be guided accordingly. A blank space is left below each estimate for the reader's notes from time to time.

Due consideration of these remarks may help the reader to realise that in the Far East Rand Goldfields it is far more remunerative and in reality safer, too, to buy in while both mines and shares have still before them an almost certain prospect of constantly increasing intrinsic and market values. A study of the estimates will show that practically the only mines whose shares can now be bought at prices which ensure these conditions are the shares of the mines now being opened up in the southern half of the goldfield.

NOTE ON SHARE VALUES.

The present values of the shares as calculated in the estimates for each of these mines are, I believe, as correct as present data will allow; it is impossible to foresee what economic changes may take place in the future with regard to labour, costs and taxation. These values have been calculated purely on an investment basis, and considerable variations may occur through market speculation; they are based on a 10 per cent. rate of interest plus return of capital invested, the lowest rate on which a mining proposition should be calculated, and only possible here because of the extreme regularity of the values of the payable tonnages in the Far East Rand gold mines as compared with most other mines. It will be seen that, in the case of many of the great gold-producing companies, the calculated value of the shares agrees fairly closely with the present market prices of those companies which have now reached a steady producing stage, and apart from some unforeseen and unexpected increase of profits, or lowering of costs, these shares are now bound to decrease in value from year to year. It will be seen that any increase in crushing capacity enhances the value of the shares to a certain extent; there is a fixed amount of gold in the mine, and therefore a definite profit value; if this profit is realised in a shorter period by means of more rapid extraction, the value of the shares is necessarily enhanced. The increase in value due to this cause does not take place according to any simple proportion; it can be calculated without much trouble by anyone acquainted with the principles of compound interest and the use of a table of logarithms. Increased crushing capacity usually necessitates an increase of capital, but in this case the relation between value and capital is a simple one, the value of the shares diminishing in just the same ratio as the capital is increased; thus an increase of capital from £1,000,000 to £1,500,000, that is, from 2 to 3, means that the value of the share drops from 3 to 2 at the same time. Although the values calculated in the following pages are in all cases based on the present issued or authorised capital, it is quite easy, therefore, to find the corresponding value should the capital be increased.

It should be clearly understood that the share values stated for the various companies are calculated entirely from the point of view of the investor. The price of a share in any particular company on the basis taken, allows the investor to receive an annuity during the life of the mine of such amount that every year a proportionate part of his investment is returned to him together with interest at the rate of 10 per cent. on the whole amount invested. In this way the shareholder amortises his own capital, and when the mine finally closes he has got back the whole of his original investment, and any small payments accruing from sale of shares and machinery, or from reclamation work will come as a "bonsella." This seems a perfectly justifiable way of considering the matter from the investor's standpoint. He receives his dividends every year, and he is quite justified in dividing the dividend into two portions, one being considered as interest, and the other as amortisation of his own capital; he still has the same number of *shares* in the mines, but their *value* is being steadily reduced. It is obvious, however, that to allow him to do this the dividends paid by the mine must be sufficient

to pay the 10 per cent. interest, and the yearly quota of returned capital in addition.

These values are calculated on the assumption that the profits of each mine are paid out annually in equal instalments. No mine has ever yet paid uniform dividends through a long series of years, but it will be found that some of the Rand mines have come fairly near to that ideal; the variations are quite irregular (though these naturally tends to be a maximum about the middle of the productive stage), and therefore the assumption of uniform dividends seems the only workable hypothesis. At the end of the book an example is given showing the yearly changes in the present values of the shares of the Modder Deep Mine from the present time till it finally closes down.

NOTES ON THE VAN RYN UPPER LEADERS AND THE NIGEL AND TATHAM REEFS AS POSSIBLY AFFECTING SHARE VALUES.

It should be mentioned that a number of deep level mines on the Van Ryn Reef may discover still further payable reefs in the Van Ryn Series. Above the reef bodies usually worked in these mines certain rich leaders have already been found elsewhere. These are they which have had such a great influence in the original New Kleinfontein, Van Ryn Estates, and New Modder mines. These leaders, I understand, have now been located and are being driven on in the Government Areas Mine. And I see no reason why they should not be located and developed in other mines. I suggest that crosscuts into the hanging wall beds should be made at intervals in all the mines like Geduld, Springs, Brakpan and others where these leaders do not appear so far to have been located or systematically tested. Like in the main bodies of the Van Ryn Reef, the gold in these leaders occurs in enriched shoots, alternating with areas which contain but little gold, and systematic exploration is required to locate the areas where they are payable.

There is also a favourable factor which may possibly affect the outcrop mines like New Kleinfontein, Van Ryn Estates, New Modder, Modder B, and Geduld. That is the existence of both the Nigel and Tatham Reefs at some depths below their present workings on the Van Ryn Reef. The Nigel Reef has been taken into account in the calculations for the Modder East, but for that mine only, and no account has been taken of the Tatham Reef in any of the estimates. Reference to the data taken from the official reports of the Modder West Mine, about 2,000 feet north of the Van Ryn Reef outcrop on the Van Ryn Estates Mine, will show that payable, in fact rich, values are being opened up on this underlying reef in this new mine, and there is no reason why this Reef may not be found to be payable at many other places on the Far East Rand.

NOTE.—The present values are calculated for all the shares as at December 31st, 1919. Readers will understand from the foregoing notes that the shares of mines which have reached their full producing stage will gradually decline in present value year by year, while the shares of mines which have not yet reached their full producing stage will increase in present value from year to year until that stage is reached.

(1) NEW KLEINFONTEIN.

Control	Anglo-French.
Capital, £1,300,000. Issued	£1,151,540.
Original area, 1,805 claims. After deducting claims worked out and after taking off 250 for faulted ground, estimated remaining to be mined...	1,250 claims.
Estimated payable tonnage per claim	10,000 tons.
Estimated payable tonnage remaining end of 1919 ...	12,500,000 tons.
Estimated recovery value per payable ton	24s.
Estimated value of gold remaining to be mined end 1919 ..	£15,000,000.
Estimated profit per payable ton when normal post-war conditions prevail	4s.
Total market valuation at present price of 11s. per share (Sept., 1919)	£633,347.
Estimated profit for remaining life of mine, £2,500,000, less £300,000 to cover the 10 per cent. Profit Tax and Phthisis Contribution	£2,200,000.
Estimated gross return per each £1 invested at present price of 11s. per share	£3 10s.
Estimated profit after return of each £1 invested at present price	£2 10s.
Estimated life of mine	20 years.

Present value of £1 share on the basis of present issued capital and of above estimated profits, to give return of the money invested and 10 per cent. interest per annum for remaining life of mine, 16s. 2d.

Developed payable ore reserves at end December, 1918 (pay limit 5·01 dwts.), 1,437,000 tons of average value 6·28 dwts.

Crushings average 70,000 tons per month; average value, May, June and July, 1919, 24s. 11d. per ton. Average loss for these three months, 1s. 3d. per ton.

Last dividend, 1917, 1s. per share.

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(2) VAN RYN GOLD MINES ESTATES, LTD.

Control	Albu.
Capital, all issued	£500,000.
Original area = 7,944 acres freehold: 534 morgen mining area, of which 187 reef-bearing claims; remaining to be mined, estimated	65 claims.
Estimated payable tonnage per claim	50,000 tons.
Estimated payable tonnage remaining end of 1919 ...	3,250,000 tons.
Estimated recovery value per payable ton	23s.
Estimated value of gold remaining to be mined end 1919...	£3,740,000.
Estimated profit per payable ton when normal post-war conditions prevail	5s.
Total market valuation at present price of 17s. 6d. (Sept., 1919)	£437,500.
Estimated profit for remaining life of mine, £812,500, less £62,500 to cover the 10 per cent. Profits Tax and the Phthisis Contribution	£750,000.
Estimated gross return per each £1 invested at present price	£1 14s.
Estimated profit after return of each £1 invested at present price	14s.
Estimated life of mine	8 years.

Present value of £1 share on the basis of above estimated profits, to give return of the money invested and 10 per cent. interest per annum for remaining life of mine, £1.

Developed payable ore reserves at 30th June, 1918, 1,347,916 tons, 5·6 dwts.

Crushings average 34,500 tons per month. Average value, May, June and July, 1919, 18s. 11d. per ton. Average profit these three months, 3s. 4d. per ton.

Last yearly dividend, 1918, 2s. per share.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(3) NEW MODDERFONTEIN GOLD MINING COMPANY, LTD.

Control	Corner House.
Capital, all issued, 350,000 £4 shares	£1,400,000.
Original area, 1,200 morgen freehold, mining claims 1,301, less 36 north of the Reef and 286 worked out, leaving to be mined, estimated	980 claims.
Estimated payable tonnage per claim	30,000.*
Estimated payable tonnage remaining end of 1919 ...	29,400,000 tons.
Estimated recovery value per payable ton	42s. 6d.
Estimated value of gold remaining to be mined... ...	£62,475,000.
Estimated profit per payable ton	22s. 6d.
Total market valuation at present price of £27 per £4 share (Sept., 1919)	£9,450,000.
Estimated profit for remaining life of mine, £33,075,000, less £4,075,000 to cover the 10 per cent. Profits Tax and the Phthisis Contribution	£29,000,000.
Estimated gross return per each £1 invested at present price of £27 per £4 share	£3 1s. 6d.
Estimated profit after return of each £1 invested at present price	£2 1s. 6d.
Estimated life of mine	30 years.

Present value of £4 share on basis of above estimated profits, to give return of the money invested and 10 per cent. interest per annum for remaining life of mine, £26 1s.

Developed payable ore reserves, June 30th, 1918, 9,000,000 tons, 8·6 dwts.

Crushings average 82,000 tons per month. Average value, May, June and July, 1919, 42s. 10d. per ton. Average profits for these three months, 22s. 6d. per ton.

Dividends, July, 1918, to June, 1919, 50s. per £4 share.

NOTE.—This estimate of 30,000 payable tons per claim for this mine may be considered excessive. I have raised it from my original estimate of 25,000 tons per claim, on account of the larger pay tonnages now being developed on the upper leader of the Van Ryn series.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(4) MODDERFONTEIN B GOLD MINES, LTD.

Control	Corner House.
Capital, all issued	£700,000.
Original area, 4,516 morgen freehold, mining claims 1,467. of which 110 are non reef bearing = 1,357, of which remaining to be mined, estimated	1,150.
Estimated payable tonnage per claim	22,000 tons.
Estimated payable tonnage remaining end of 1919 ...	25,300,000.
Estimated recovery value per payable ton	42s. 6d.
Estimated value of gold remaining to be mined... ...	£53,762,500.
Estimated profit per payable ton	22s. 6d.
Total market valuation at present price of £8 11s. per share (Sept., 1919)	£5,988,500.
Estimated profit for remaining life of mine £28,462,500 less £3,250,000 to cover the 10 per cent. Government Profit Tax and the Phthisis Contribution	£25,212,500.
Estimated gross return per each £1 invested at present price of £8 11s. per share	£4 4s.
Estimated profit after return of each £1 invested at present price	£3 4s.
Estimated life of mine	35 years.

Present value of £1 share on the basis of above estimated profits, to give return of the money invested and 10 per cent. interest per annum for remaining life of mine, £9 18s. 6d.

Developed payable ore reserves, December, 1918, 3,378,000 tons, 9·2 dwts.

Crushings average 54,500 tons per month. Average value, May, June and July, 1919, 43s. 10d. per ton. Average profit for these three months, 22s. 6d. per ton.

Dividends for year ending June, 1919, 17s. per share.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(5) VAN RYN DEEP, LTD.

Control	Barnato.
Capital, all issued	1,196,892.
Original area, 768 claims, less 223 estimated as worked out, remaining to be mined, estimated	545.
Estimated payable tonnage per claim	20,000.
Estimated payable tonnage remaining end of 1919 ...	10,900,000 tons.
Estimated recovery value per payable ton	42s. 6d.
Estimated value of gold remaining to be mined... ...	£23,162,500.
Estimated profit per payable ton	22s. 6d.
Total market valuation at present price of 75s.... ...	£4,500,000.
Estimated profit for remaining life of mine, £12,200,000, less £1,400,000 to cover the 10 per cent. Profits Tax and Phthisis Contribution	£10,800,000.
Estimated gross return per each £1 invested at present price	£2 8s.
Estimated profit after return of each £1 invested... ...	£1 8s.
Estimated life of mine	18 years.

Present value of £1 share on the basis of above estimated profits, to give return of the money invested and 10 per cent. interest per annum for remaining life of mine, £4 2s.

This Company holds 150,000 shares in the New State Areas, Ltd. This asset has not been taken into account in this estimate of present value of the Van Ryn Deep shares. If taken into account it would add about 4s. to the present value, bringing it up to £4 6s.

Developed payable ore reserves at December, 1918, 2,445,760 tons, value 9 dwts.

Crushings average 48,000 tons per month. Average value, May, June and July, 1919, 42s. 9d. per ton. Average profit for these three months, 22s. 1d. per ton.

Dividends for year ending June 30th, 1919, 9s. per share.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(6) MODDERFONTEIN DEEP LEVELS, LTD.

Control	Goerz.
Capital, all issued	£500,000.
Original area, 377½ claims, less estimated 90 claims worked out, remaining to be mined, estimated ...	287½.
Estimated payable tonnage per claim	28,000 tons.
Estimated payable tonnage remaining end of 1919 ...	8,000,000 tons.
Estimated recovery value per payable ton	40s.
Estimated value of gold remaining to be mined... ...	£16,000,000.
Estimated profit per payable ton	22s. 6d.
Total market valuation at present price of £8 10s. per original £1 per share (Sept., 1919)	£4,250,000.
Estimated profit for remaining life of mine, £9,000,000, less £1,000,000 to cover the 10 per cent. Profits Tax and Phthisis Contribution	£8,000,000.
Estimated gross return per each £1 invested at present price of £8 10s. per share	£1 17s. 9d.
Estimated profit after return of each £1 invested... ...	17s. 9d.
Estimated life of mine	16 years.

Present value of £1 share on the basis of above estimated profits, to give return of the money invested and 10 per cent. interest per annum for remaining life of mine, £7 16s. 6d.*

Developed payable ore reserves at December, 1918, 3,450,000 tons, value 8·8 dwts.

Crushings average 42,000 tons per month. Average value, May, June and July, 1919, 43s. 7d. per ton. Average profit for these months, 25s. 6d. per ton.

Dividends for year ending June 30th, 1919, 13s. 4½d. in cash and one new (enemy) share for every 20 shares held.

*See Appendix for present values of these shares on this estimate for each year till end of life of mine. These £1 shares have been split into 5s. shares. Above values must therefore be divided by 4 to find market price as now quoted.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(7) GEDULD PROPRIETARY MINES, LTD.

Control	Goerz.
Capital, £1,500,000; issued	1,150,000.
Original area, freehold of Geduld Farm, 8,480 acres, mining area 2,481 claims, of which remaining to be mined, estimated	2,200.
Estimated payable tonnage per claim	10,000 tons.
Estimated payable tonnage remaining end of 1919 ...	22,000,000 tons.
Estimated recovery value per payable ton	31s. 9d.
Estimated value of gold remaining to be mined	£51,000,000.
Estimated profit per payable ton	12s. 6d.
Total market valuation at present price of 51s. (Sept., 1919)	£2,900,000.
Estimated profit for remaining life of mine, £13,750,000 less £1,500,000 to cover the 10 per cent. Profits Tax and the Phthisis Contribution	£12,250,000.
Estimated gross return per each £1 invested at present price of 51s. per share	£4 4s. 0d.
Estimated profit after return of each £1 invested... ...	£3 4s. 0d.
Estimated life of mine	44 years.

Present value of £1 share on the basis of above-estimated profits, and at present rate of crushing and present issued capital, to give return of the money invested and 10 per cent. interest per annum for remaining life of mine, £2 7s. 6d.

Present value of each £1 on full capital of £1,500,000 on the basis of above estimated profits and on crushing 1,000,000 tons per annum that is a life of 22 years to give return of the money invested and 10 per cent. interest for the remaining life of the mine is £3 3s. 6d.

Developed payable ore reserves at December, 1918, 2,510,000 tons, value 7½ dwts.

Crushings average 42,500 tons per month. Average value, May, June and July, 1919, 30s. per ton. Average profit for these months, 9s. 7½d. per ton.

Dividends for year ending December, 1918, 2s. 3d. per share, plus enemy shares 2 for every 25 held.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(8) BRAKPAN MINES, LTD.

Control	Consolidated Mines Selection.
Capital, £850,000, issued 806,600 (for purpose of this estimate the whole capital is taken)	£850,000.
Original area 1,150 claims, 1,812 claims leased from Government, and 425 Schapenrust claims, total 3,387, less 387 estimated as worked out, leaving, estimated, remaining to be mined	3,000 claims.
Estimated payable tonnage per claim	12,500 tons.*
Estimated payable tonnage remaining end of 1919 ...	37,500,000 tons.
Estimated recovery value per payable ton for the whole vast area, three-fourths of which is wholly unexplored	32s. 6d.
Estimated value of gold remaining to be mined end 1919...	£61,000,000.
Estimated profit per payable ton	12s. 6d.
Total market valuation at present price of 70s. per share, September, 1919	£2,975,000.
Estimated profit for remaining life of mine, £23,687,000,	

Divided as follows on formula $y = 50 - \frac{1150}{x}$

y = Government's share – x = ratio of nett produce to recovery.

For the years 1920-21 :—

To Government.		To Company.	
Government's share for 1920-1921—		Estimated amortization...	£86,000
10 per cent. profits	£91,400	Company's share for 1920-1921..	781,470
5 per cent. ...	41,130		
	£132,530		£867,470

For the years 1922-1946, £22,475,000.

To Government.		To Company.		
Government's share, 20 per cent. on basis of 37½ per cent. ratio of nett profit to recovery and 10 per cent. Profits Tax ...	£6,072,500	Estimated amortization...	£1,000,000	
		Balance... ...	15,615,000	
	£6,072,500		£16,615,000	Total, £17,482,470.

*In view of the fact that only 43½ per cent. of the areas developed on this mine has so far proved to be payable, this estimate may be considered excessive, and for those inclined to caution 10,000 payable tons per claim may appear more likely to be realised. On that basis the total profits would only be £19,000,000, of which approximately £4,750,000 would go to the Government and £14,250,000 to the Company. The present value of the shares on this basis on present capital and life of 60 years would be £2 15s. 8d.

(8) BRAKPAN MINES, LTD.—(Continued).

Estimated gross return for each £1 invested at present price of 70s. ... ... £5 18s.

Estimated profit after return of each £1 invested... ... £4 18s.

Present value on above basis of profits at the present rate of crushing, equivalent to a life of 60 years to give return of the money invested and 10 per cent. interest for remaining life of mine, £3 6s. 6d.

Present value of £1 shares on the basis of the above estimated profits and same capital, viz., £850,000, to give return of capital and 10 per cent. for remaining life of mine of 25 years on an annual crushing of 1½ million tons, assuming full production in 1922, £6 15s. 8d.*

Developed payable ore reserves end of 1918, 2,718,000 tons, value 8·7 dwts. Percentage of payability from inception of mine to date, 43½ per cent.

Crushings average 49,000 tons per month for first six months, 1919. Average value, May, June and July, 42s. 7d. per ton. Average profit, May, June and July, 12s. 4d. per ton.

Dividend for year ending June, 1919, 5s. per share=25 per cent. on par value.

*The Consolidated Mines Selection Company are under obligation to lend £250,000 to the Company if required at a minimum of 5½ per cent. interest. As the mine will almost certainly require this money to reach a productive stage of 1½ million tons per annum, allowance has been made in these calculations for the borrowing and for the repayment of such a loan with interest.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(9) GOVERNMENT GOLD MINING AREAS (MODDERFONTEIN CONSOLIDATED), LTD.

Control	Barnatos.
Capital, all issued	£1,400,000.
Original area 2,633 claims, less 233 estimated as worked out, leaving to be mined end 1919	2,400 claims.
Estimated payable tonnage per claim	25,000.
Estimated payable tonnage remaining end of 1919 ...	60,000,000 tons.
Estimated recovery value per payable ton	40s.
Estimated value of gold remaining to be mined end 1919...	£120,000,000.
Estimated profit per payable ton	20s.
Total market valuation at present price of 90s. per share, September, 1919	£6,300,000.

Estimated profit for remaining life of mine, total £60,000,000, divided as follows on a sliding scale based on ratios of nett produce to recovery, of which the following are examples :—

Ratio.	Government share.
40 per cent.	46·33 per cent.
45 ,, ,,	50·34 ,, ,,
50 ,, ,,	53·56 ,, ,,
55 ,, ,,	56·19 ,, ,,

This mine is exempt from the ordinary 10 per cent. Profits Tax.

Amortization is allowed at the rate of £69,000 a year. Estimated for amortization £1,400,000 to the Company, leaving £58,600,000 to be divided. On the ratio of produce to recovery of 50 per cent. ratio of nett produce to recovery, the Government's share will be 53·56 per cent.

To Government.	To Company.		
£31,351,000	Amortization	£1,400,000	
		27,249,000	
£31,351,000		£28,649,000	£28,649,000.

Estimated gross return per £1 invested at present price of 90s. per share, September, 1919	£4 10s. 3d.
Estimated profit after return of each £1 invested at 90s. per share	£3 10s. 3d.
Estimated life of the mine on the contemplated crushing basis of 2,000,000 tons per annum ... equals	30 years.

Present value of £1 share on basis of present crushing and estimated life of 46 years, £4 7s. 9d.

Present value of £1 share on basis of above estimated profits and life of 30 years (2,000,000 tons per annum), to give return of the money invested and 10 per cent. interest per annum for remaining life of mine, £6 8s. 9d.

Developed payable ore reserves, August, 1919, 10,000,000 tons, value 8 dwts.

(9) GOVERNMENT GOLD MINING AREAS (MODDERFONTEIN CONSOLIDATED), LTD.—(Continued).

Crushings will average 135,000 tons per month when the additional plant is in commission, and I understand that it is the intention to increase the crushing capacity within a year or so to 2,000,000 tons per annum. Average value of ore crushed, May, June and July, 1919, 34s. 7d. Average profits for these months, 14s. 6d. per ton.

Dividends for twelve months ending June, 1919, 6s. 6d. per share.

NOTE.—No allowance has been made in this estimate for Phthisis Contribution. The estimate may be considered rather optimistic in view of present returns, but development values are rising, and I have information that the same rich leaders above the Reef which are mined in the New Modderfontein Mine have been located in the hanging wall beds of Government Areas, and are now being driven on, showing high values.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(10) SPRINGS MINES, LTD.

Control	Consolidated Mines Selection.
Capital £1,500,000, of which issued at 30th September, 1919, £1,153,500, but for the purpose of this estimate the full capital will be taken, as it is all guaranteed	£1,500,000.
Original area 1,332 claims, plus 2,236 claims leased from Government, total 3,568, less estimated worked out 168, leaving to be mined	3,400 claims.
Estimated payable tonnage per claim	10,000 tons.
Estimated payable tonnage remaining end of 1919 ...	34,000,000 tons.
Estimated recovery value per payable ton	40s.
Estimated value of gold remaining to be mined... ...	£68,000,000.
Estimated profit per payable ton	16s. 8d. per ton.
Total market valuation at present price of 53s. per share...	£3,975,000.

Estimated profit for remaining life of mine, £28,300,000, divided as follows :—

For years 1920, 1921 and 1922, estimated profit £1,500,000.

To Government.		To Company.	
10 per cent. Profits Tax	£127,500	Amortization	£225,000
5 per cent. participation	57,375		1,090,125
	£184,875		£1,315,125

Profit for years 1922 to 1944, £26,800,000, divided as follows :—

$$\text{Formula } y = 55 - \frac{1175}{x}.$$

y = Government's share. x = ratio of nett produce to recovery.

To Government.		To Company.	
10 per cent. Profits Tax	£2,492,500	Amortization	£1,875,000
27 per cent. participation on basis of ratio of 42 per cent. nett produce to recovery	6,057,775	Participation to Company	16,374,725
	£8,550,275		£18,249,725
Add Company's share for 1920, 1921 and 1922			1,315,125
Total share to Company			£19,564,850

say, £19,500,000.

(10) SPRINGS MINES, LTD.—(Continued).

Estimated gross return on each £1 invested at present price of 53s. ... ... £4 18s.

Estimated profit after return of each £1 invested at present price ... ... £3 18s.

Estimated life of the mine on a crushing basis of 1,400,000 tons per annum ... ... 25 years.

Present value of £1 share on present crushing basis, and of present capital issued, £1,153,500, that is, a life of 60 years, £2 17s.

Present value of £1 share on basis of full capital of £1,500,000 and of crushing of 1,400,000 tons per annum and of above estimates of profit and life of mine, to give return of the money invested and 10 per cent. interest per annum for 25 years, £4 13s. 9d.

Developed payable ore reserves at February, 1919, 2,256,000 tons, at 8·69 dwts. value.

Crushings are calculated above on a basis of 1,400,000 tons per annum after 1922. Present rate of crushing is only 36,000 tons per month. Value for May, June and July, 1919, 37s. 9d. per ton. Profit for these three months, 12s. 10d. per ton.

Dividends for twelve months ending 1919, 2s. 6d. per share, plus 1 West Spring share for each 10 Springs Mines shares held.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(11) MODDERFONTEIN EAST, LTD.

Control, nominal £752,041			Corner House.
Capital in 1921, assuming all debentures are converted and all options exercised			£2,000,000.
Statement of capital :—			
Issued		690,459	
Reserve		51,582	
500,000 debentures to be converted...		500,000	
3 and 4 year options		747,959	
		2,000,000	
Original area: Freehold of Rand Klipfontein, 3,451 morgen. Mining area: 650 claims leased from Government, 800 Cloverfield claims, about 900 mynpacht and discovery claims Klipfontein; total, say, 2,350, of which in this estimate 1,700 are taken as Van Ryn Reef bearing (350 of these are taken as also bearing Nigel Reef at workable payable depth), and 650 as bearing only the Nigel Reef.			
Estimated payable tonnage per claim—			
Nigel Reef ...			3,000 tons.
Van Ryn Reef			10,000 tons.
Estimated payable tonnage in mine: 1,000 claims carrying Nigel Reef at payable workable depth. 3,000 tons per claim = 3,000,000 tons Nigel Reef. 1,700 claims carrying Van Ryn Reef. 10,000 tons per claim = 17,000,000			20,000,000 tons.
Estimated recovery value per payable ton—			
Nigel Reef ...			40s.
Van Ryn Reef			35s.
Estimated value of gold in the mine—			£35,700,000.
Estimated profit per payable ton—			
Nigel Reef ...			10s.
Van Ryn Reef			12s. 6d.
Total market valuation at present price of 30s.			£3,000,000.
Estimated profit for life of mine—			
Nigel Reef		£1,500,000	
Van Ryn Reef		10,625,000	£12,125,000.
divided as follows :—			
	To Government.	To Company.	
10 per cent. Profits Tax...	£1,212,500		
10 per cent. Participation	1,091,250		
	£2,303,750	£9,821,250	£10,000,000.
Estimated gross return for each £1 invested at present price of 30s. per share			£3 6s. 8d.
Estimated profit after return of each £1 invested at 30s. per share			£2 6s. 8d.

(11) MODDERFONTEIN EAST, LTD.—(Continued).

Estimated life of the mine ... ... equals 30 years.

Present value of £1 share on basis of above estimated profits and life of mine, to give return of the money invested and 10 per cent. interest per annum for full life of mine, £1 11s. 6d.

Developed ore reserves, Van Ryn Reef, end June, 1919, 850,000 tons, value 440 inch-dwts., or 8 dwts. over 55 inches.

No allowance has been made in this estimate for amortization of capital. If this is taken into consideration it would increase the Company's share to some extent, and against this can be set the increased Phthisis Contribution.

Those who bear in mind the disastrous results obtained by the Cloverfield and Rand Klip companies on the areas now included in this mine lying north and north-east of the present workings may be inclined to consider these estimates unduly optimistic. In view of the fact that the development now proceeding is all on the Van Ryn Reef in the southern areas, future development towards the north should be closely watched and due caution observed until more is known as to what extent of the northern areas contains the Van Ryn Reef.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(12) NEW STATE AREAS, LIMITED.

Control	Barnatos.
Capital, all issued	£1,500,000.
Original area, 2,050 claims leased from Government, all intact	2,050.
Estimated payable tonnage per claim	15,000 tons.
Estimated payable tonnage in the mine	30,750,000 tons.
Estimated recovery value per payable ton	37s. 6d.
Estimated value of gold in mine	£57,648,750.
Total market valuation at present price of 30s. per share, September, 1919	£2,250,000.
Estimated profit per payable ton	17s. 6d.

Estimated profit for whole life of mine, £26,900,000, divided as follows:—

Formula $y = 80 - \frac{750}{x}$.

y is Government share, x ratio of net produce to recovery.

To Government.		To Company.		
10 per cent. profits	£2,690,000	Amortisation	£1,500,000	£1,500,000.
Government share of profits—60 per cent. on basis of ratio of 37½ per cent. nett produce to recovery	£13,626,000	Balance ...	£9,084,000	
	£16,316,000		£10,584,000	£10,584,000.

Estimated gross return for each £1 invested at present market price of 30s.	£4 14s. 0d.
Estimated profit after return of each £1 invested... ...	£3 14s. 0d.
Estimated life of the mine	30 years.

Present value of £1 share on basis of above estimate of profits, to give return of the money invested and 10 per cent. interest per annum for the full life of the mine, assuming that the mine reaches the producing stage during 1923, that is 4 years deferred; first full dividend end 1924 is £1 13s. 6d. On the same basis the value of the £1 share on the 1st January, 1924, will be £2 4s. 3d.

South Shaft, depth 467 feet, end June, 1919; North Shaft, 281 feet; probable depth of Van Ryn Reef, about 3,300 feet.

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(12) NEW STATE AREAS, LTD.—(Continued).

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(13) WEST SPRINGS, LTD.

Control	Consolidated Mines Selection.
Capital, £1,400,000, all issued	£1,400,000.
Original area, 2,236 claims leased from Government, all intact	2,236.
Estimated payable tonnage per claim	10,000 tons.
Estimated payable tonnage in the mine	22,236,000 tons.
Estimated recovery value per payable ton	32s. 6d.
Estimated value of gold in the mine	£36,133,500.
Estimated profit value...	12s. 6d.
Total market valuation at present price of 25s. per share, September, 1919	£1,750,000.

Estimated profit for whole life of mine, £13,897,500, say, £14,000,000, divided as follows on formula $y = 65 - \frac{650}{x}$ where y = Government share, x = ratio of nett produce to recovery.

To Government.		To Company.		
10 per cent. Profits Tax	1,260,000	Amortisation	£1,400,000	
Government share of profits—40 per cent. on basis of 35 per cent. produce to recovery	5,200,000	Balance ...	6,140,000	
	£6,460,000		£7,540,000	£7,540,000.

Estimated gross return for each £1 invested at present market price of 25s.	£4 6s. 0d.
Estimated nett profit after return of each £1 invested ...	£3 6s. 0d.
Estimated life of the mine	25 years.

Present value of £1 share on the basis of above estimate of profits. to give return of the money invested and 10 per cent. interest per annum for full life of mine, assuming that the producing stage is reached during 1923, that is 4 years deferred; first full dividend end 1924 is £1 8s. 0d. on the same basis the value of the £1 share on the 1st January, 1924, will be £2 0s. 0d.

Development to end June, 1919, 610 feet sampled to date, 6·4 dwts. over 21·2 inches. For the quarter the payable footage was 165 feet, 10·9 dwts. over 34 inches.

(13) WEST SPRINGS, LTD.—(Continued).

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(14) DAGGAFONTEIN MINES, LIMITED.

Control		Consolidated Mines Selection.
Capital issued, £947,633. For purposes of this calculation the capital is taken at £1,500,000, the amount which will almost certainly be required to bring the mine to the producing stage on the scale projected ...		£1,500,000.
Original areas: Freehold farm Daggafontein = 6,283 claims. Company owns 179 claims as discoverers, and also 1,257 further selected claims, and has acquired 173 more in exchange for 173 Geduld Deep claims which it held, and a further 450 claims on lease from the Government; total, 2,059 claims. Also holds freehold interest in remaining 4,847 claims, which will bring in a revenue of £600 per month to the Company		2,059 claims.
Estimated payable tonnage per claim—		
Nigel Reef	5,000	
Van Ryn Reef	10,000	
Estimated payable tonnage in mine—		
Nigel Reef	10,295,000	
Van Ryn Reef	20,590,000	
		30,885,000 tons.
Estimated recovery value per payable ton—		
Nigel Reef	40s.	
Van Ryn Reef	35s.	
	Total gold	£56,600,000.
Estimated profit per payable ton—		
Nigel Reef	12s. 6d.	
Van Ryn Reef	12s. 6d.	12s. 6d.
Total market valuation at present price of 25s. per share...		£1,875,000.

Estimated total profit in mine, £19,300,000, divided as follows:—

To Government.		To Company.		
10 per cent. Profit Tax	£1,780,000	Amor.	£1,500,000	
Estimated as Government share of profits in respect of 450 leased claims ...	1,220,000		14,800,000	
	£3,000,000		£16,300,000	£16,300,000.

Estimated gross return for each £1 invested at present market price of 25s.	£8 14s 0d.
Estimated nett profit after return of each £1 invested ...	£7 14s. 0d.
Estimated life of the mine	50 years.

Value of £1 share on basis of a capital of £1,500,000 and crushing capacity

(14) DAGGAFONTEIN MINES, LTD.—(Continued).

of 600,000 tons per annum* and of above estimate of profits, to give return of the money invested and 10 per cent. interest per annum for full life of mine, assuming that the producing stage is reached in 1921, and that development is carried out on both reefs, that is, two years deferred, first full dividend end 1922, is £1 15s. 7d. On the same basis the value of the £1 share on the 1st January, 1922, will be £2 3s. 1d.

Present value if only the reef at present being developed—the Nigel—is worked, and with same capital and life, 13s.

NOTE.—On this mine the No. 1 Shaft Eastern was sunk through the Van Ryn Reef at 2,100 feet and continued to the Nigel Reef at 3,561 feet, which is the reef now being developed at the bottom of this shaft. The total development on this reef to June, 1919, shows 47·6 per cent. payable, assaying 28·4 dwts. over 18·08 inches. The No. 2 Shaft (Western) has attained a depth of about 2,300 feet (September, 1919), and should cut the Van Ryn Reef at about 2,500 feet, and the Nigel Reef at about 4,000 feet. (See text, pp. 5 and 16.) No development has yet been done on the Van Ryn Reef in this mine. If the estimate for this mine were based only on the Nigel Reef that is at present being worked from the No. 1 Shaft, the gross profit would be only £6,434,750, and the mine would barely be payable on its capitalized basis. 4,000 feet of linear development on Nigel Reef at the end of June, 1919, averaged 22·5 dwts. over 12·5 inches. 47 per cent. was payable, assaying 28·4 dwts. over 17·08 inches.

*This estimate may be considered optimistic in regard to full production at the rate of 600,000 tons a year being reached by January, 1922. This can be done, but only by immediately commencing vigorous development on the Van Ryn Reef from both shafts.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(15) SOUTHERN VAN RYN REEF GOLD MINING CO., LTD

Control		Bleloch.
Capital authorised, £615,000 in £1 shares. (£322,500 shares issued and fully paid.) (Cash, August, 1919, £85,000; plus to come in if all options are exercised, £294,526)		£615,000.
Original area on Varkensfontein and Marievale		1,662 claims.
Estimated payable tonnage in mine, 5,000 tons per claim Nigel Reef (1,662 claims) and 15,000 tons per claim Van Ryn Reef (1,600 claims). The angle of dip of the beds in this property is over 40 degrees, consequently the tonnage per claim is greater.		
Estimated payable tonnage in mine—		
Nigel Reef	8,310,000 tons	
Van Ryn Reef	24,000,000 ,,	32,310,000 tons.
Estimated recovery value per payable ton—		
Nigel Reef	40s. 0d.	
Van Ryn Reef	32s. 6d.	
Estimated value of gold in mine		£55,620,000.
Estimated profit per payable ton		
Nigel Reef	20s. 0d.	
Van Ryn Reef	12s. 6d.	
Estimated profit for life of mine—		
Nigel Reef	£8,310,000	
Van Ryn Reef	15,000,000	
	£23,310,000	
Less Government 10 per cent. Profits Tax	2,331,000	
	£20,979,000	say, £21,000,000.
Total valuation at par, 20s. per share		£615,000.
The present price is only 9s. to 10s., Johannesburg, equal to, say, £300,000.		
Estimated gross return per each £1 invested at par (20s.) (At present Johannesburg price, it would be £68 per £1 invested.)		£34.
Estimated profit per £1 invested at par		£33.
Estimated life of the mine, on an average crushing basis of 600,000 tons per year ... ... equals		54 years.

Present value of £1 share on basis of above estimate of profits for both reefs, to give return of the money invested and 10 per cent. interest per annum for full life of mine, assuming full production at the end of 1922, that is, three years deferred, first full dividend end 1923, is £4 12s. 6d., and on the same basis the value of the £1 share on January 1st, 1923, will be £6 2s. 9d.

These present values are calculated on the present capital of £615,000, which is not likely to be exceeded, because after one to two million tons of payable ore are developed it will be possible to raise £250,000 to £350,000 in debentures bearing 8 to 10 per cent. interest, repayable in 10 years. A sum of £500,000 has been deducted from the estimated profits to provide for such a loan. Actual production on a small scale will commence during 1920, and the

(15) SOUTHERN VAN RYN REEF GOLD MINING CO., LTD.—(Continued).

profits on this and on similar production during 1921 and 1922 will add to the cash resources perhaps sufficiently to reduce the amount of the debentures issue which may be required to below £250,000 or even to obviate it altogether. With two reefs to draw from .which can be developed simultaneously, with no deep level shafts—expensive both in money and time—to sink, and with the very favourable working conditions due to the high angle of dip of the ore bodies, there is no reason why this programme and the present values based on it should not be realised or even considerably exceeded. This is the only mine remaining on the developed portion of the Far East Rand which possesses a large virgin mine of 1,662 claims on the Van Ryn and Nigel Reefs, as its own property, and not subject to any Government lease; consequently all the profits, less the 10 per cent. Profits Tax, belong to the shareholders.*

Development.—The following is taken from the Consulting Engineer's report of work done on the above Company's property for the month of August, 1919:—

NORTH SECTION.

Van Ryn Reef Development.—No. 1 Incline. The north drive has reached a distance of 75 feet, 33 feet of driving having been done for the month. The reef is improving in both width and value. A sample taken from the face when the drive was in 70 feet assayed 9·85 dwts. over 24 inches. The reef width is now 30 inches.

The south drive has advanced 39·5 feet for the month, being now in for a distance of 86·5 feet. The reef in this drive is also improving in width and values as the heading advances. A sample taken when the face was in 80 feet assayed 3.25 dwts. over 20 inches. The reef width is now 26 inches.

Nigel Reef.—The three prospecting shafts that were being sunk at the north-eastern portion of the property have been stopped, sufficient information having been obtained from them to prove the position of the Nigel Reef in this area.

SOUTH SECTION.

Van Ryn Reef.—It is hoped that borehole No. 16 will locate the reef at about 100 feet, so that the New Incline Shaft which will open up this reef at the Southern end of the property can be started. This borehole, No. 16, is situated 600 feet from the Henderson Nigel Shaft, which exposed the Van Ryn Reef at a depth of 217 feet.

Nigel Reef.—The Nigel Reef—sub-outcrop—is situated about 2,000 feet to the south-east of the Henderson Nigel Shaft, and in consequence will have to be developed at this end of the property from a Vertical Shaft some 1,200 feet in depth. It will probably interest shareholders, however, to know that the "Nigel Van Ryn Reefs, Ltd.," are working the Nigel Reef at its sub-outcrop, 2,000 feet east of this Company's property, and that development is disclosing payable values in all headings. Some 7,000 tons of payable ore have already been blocked out for stoping, and a small crushing plant is now at work on their property.

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*The estimates of profits on which the present values of the shares in this and the other outcrop mines dealt with later are based have deliberately been framed conservatively and may be exceeded by actual results. That they compare so favourably with the deep levels is due to the greatly smaller capital required and the shorter initial development period. After they have produced profits for a few years on the moderate production of the estimates, a comparatively small addition to the capital would suffice to increase the rate of production and reduce the lengths of the lives possibly by one-third, and the value of the shares would be proportionately increased

(15) SOUTHERN VAN RYN REEF GOLD MINING CO., LTD.—(Continued).

NOTE BY MR. C. J. TUTT, CONSULTING ENGINEER, SOUTHERN VAN RYN REEF G.M. CO., LTD.—I wish to make the following comment on the above estimate of gold production and profit of this mine. The estimated tonnage per claim for the Van Ryn Reef is given as 15,000 payable tons, the angle of dip is stated as being approximately 40 degrees; the area containing the Van Ryn Reef 1,600 claims. I consider this estimate too low in so far as the upper levels of the mine are concerned. Mr. Bleloch's statement of 40 degrees angle of dip no doubt refers to the average angle of dip for the whole area. The data obtained by boreholes show, however, that down to 1,000 feet the angle of dip is about 60 degrees. At this angle of dip the reef can be worked on a stoping width of 30 inches, that is, half the stoping width required on the deep level mines with their flat reef. This factor has a most important bearing on the pay tonnages per claim, as large areas of Van Ryn Reef have to be eliminated in the flat mines, because the values are too low over a stoping width of 60 inches. Over a great proportion of such areas the gold lies in an actual reef thickness of 6 to 18 inches, and if the reef were inclined at 60 degrees, as in the upper levels of the Southern Van Ryn, a great part of these areas eliminated as unpayable would be highly profitable, and the proportion of payability would be raised from one-half to probably three-fourths or more of the total area. It has a further important bearing on the Southern Van Ryn Mine in the fact that the Van Ryn Reef in the present development drives is showing payable values over 24 inches; 6 inches of the footwall shale can be carried in the stope, and 24 inches of clean reef can be mined. It is the intention to take advantage of these favourable conditions, which have not been possessed by any other mine on the Far East Rand since the early days of the Van Ryn Mine itself, to commence stoping as soon as 10,000 to 15,000 tons of pay reef are developed, and to crush this, together with the development ore, and thus make an early beginning with production, the revenue from which will assist in the further development of the mine. Similar conditions of high angle of dip obtain with the Nigel Reef also, and, seeing that the tonnage per claim on a 60 degree angle of dip is 10,671 tons per foot of reef, and that the tonnage of the Southern Van Ryn is the combined tonnage of both the Nigel and Van Ryn Reefs, it is evident that the estimate of 20,000 tons per claim for both reefs is extremely conservative and may be exceeded by possibly as much again in actual results in the upper levels, and by possibly half as much again in the lower levels of the mine.

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(15) Southern Van Ryn Reef Gold Mining Co., Ltd.—(Continued).

Space for Reader's Notes. Capital, Development, Market Quotations, Etc.

(16) NIGEL VAN RYN REEFS, LIMITED.

Control	Bleloch.
Capital £100,000 in 200,000 10s. shares, of which 180,000 shares are issued	£100,000.
Original area	257 claims.
Estimated payable tonnage per claim. (Owing to steep angle of dip, the tonnage per claim on the Nigel Reef in this mine is estimated at 1,000 tons more than in the Sub Nigel)	5,000 tons.
Estimated payable tonnage in mine	1,275,000 tons.
Estimated recovery value per payable ton, Nigel Reef ...	42s. 6d.
Estimated value of gold in mine	£2,709,375.
Estimated profit per payable ton, Nigel Reef	22s. 6d.
Total market valuation at par	£100,000.
Estimated profit for remaining life of mine, £1,434,375, less 10 per cent. Profits Tax	£1,280,948.
Estimated life of the mine	15 years.

Developed payable ore end of August, 1919, 12,000 tons, value 40s. per ton.

The Present Value of the 10s. Shares on the basis of the above estimates of profits and on the present capital of £100,000 and by crushing on a small but gradually increasing scale for the first three years applying the profits of these three years estimated at about £60,000 to capital expenditure and development and a full crushing policy of 8,000 tons a month, or 100,000 tons a year at the end of 1922, that is first dividend (full) to be paid at end of 1923, by continue at the same rate for 12 years, is £2 11s. 3d.

In case it is desired to reach the full productive stage of 100,000 tons at the end of 1922, that is first dividend (full) to be paid at end of 1923, by providing an additional £40,000 working capital thus raising the capital to £140,000 and by proceeding with much accelerated development, the present value on this basis and on the same estimate of profit with life of mine 13 years, 12 of which would be productive, is £2 8s. This mine presents a striking example of the advantage possessed by an outcrop mine through it being possible to pay for development partly out of profits and thus keep the capital low.

Development.—The following are extracts from the Consulting Engineer's report for August :—

"'A' Incline Shaft—

		Total Footage.
1st Level South Drive ...	80 feet. ...	298 feet.
1st ,, South Winze ...	15·5 ,, ..	23·5 ,,
1st ,, North Drive ...	25·5 ,, ...	174·5 ,,
'A' ,, North Winze ...	23·0 ,, ...	77·0 ,,
2nd ,, South Winze ...	13·0 ,, ...	13·0 ,,
Total	157·0 feet.	

"'A' Level North Winze has holed into the 1st Level North. The values and width of reef in this winze held good to within 6 feet of holing. At

(16) NIGEL VAN RYN REEFS, LTD.—(Continued).

that point, the dyke that has been driven on, 1st Level North, was encountered, and the 6 feet of winzing was done on the dyke contact. 77 feet is the length of this winze, and 71 feet is on payable reef. It will thus be seen that another block of payable ore, of approximately 2,000 tons, has been opened on the north of the Incline Shaft, bringing the payable ore developed, ready for stoping, up to 7,000 tons.

"1st Level, South Drive, has been advanced 80 feet during the month, and is now in for a distance of 298 feet. The reef width and values still hold good, panning approximately 9 dwts. over 24 inches.

"The North Drive, 1st Level, is in for a distance of 174·5 feet, 25 feet of driving having been done for the month. The reef has thinned down to about 4 inches in width, but the values are very good, being approximately 3 ozs. over the 4 inches.

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(17) SUB NIGEL, LTD.

Control		Consolidated Goldfields.
Capital, £775,000 in £1 shares, to be increased in 1921 to...		£905,000.
Original area, 2,378 claims on Droogebult, Noycedale and Grootfontein, of which 1,900 are intact		1,900 claims.
Estimated payable tonnage per claim—		
Nigel Reef	4,000 tons	
Van Ryn Reef	12,500 ,,	16,500 tons.
Estimated payable tonnage remaining end of 1919—		
Nigel Reef	7,600,000 tons	
Van Ryn Reef	23,750,000 ,,	31,350,000 tons.
Estimated recovery value per payable ton—		
Nigel Reef	45s. 0d.	
Van Ryn Reef	32s. 6d.	
Estimated value of gold remaining in mine		£55,725,000.
Estimated profit per payable ton—		
Nigel Reef	15s. 0d.	
Van Ryn Reef	12s. 6d.	
Estimated profit in mine, £20,500,000, less 10 per cent. Profits Tax, £2,050,000		£18,450,000.
Total market valuation at present price of 22s. 6d. per share		£1,018,125.
Estimated nett profit from Nigel Reef only		£5,130,000.
Estimated gross return for each £1 invested at present price		£18 2s. 0d.
Estimated profit after return of each £1 invested at present price		£17 2s. 0d.

Present value of £1 share on present issued capital of £775,000 and present crushing basis of 130,000 tons per annum from Nigel Reef only, which is equal to a life of 60 years, and on the above estimate of profits from the Nigel Reef to give return of the money invested and 10 per cent. interest for the remaining life of the mine, is £1 2s. 0d.

Present value of £1 share on full authorised capital of £905,000, assuming an annual crushing of 300,000 tons, and corresponding life of about 25 years, on Nigel Reef only, £2 1s. 6d.

Present value of £1 share to give return of the money invested and 10 per cent. per annum for the remaining life of the mine on the above estimated profits (and assuming that both the Van Ryn and the Nigel Reefs are worked, and with increase of capital to £1,200,000; with present rate of crushing on Nigel Reef only for 1920, 1921 and 1922 a full rate of crushing of 1,000,000 tons per year from the two reefs for 1923 and onwards equal to a total life of 34 years; first full dividend end 1923), is £3 12s. 6d. On this same basis of capital and estimated profits and Value of each £1 share on January 1st, 1923, will be £4 12s. 9d.

Developed payable ore reserves, December, 1919, Nigel Reef, 400,000 tons, 10·3 dwt. The Van Ryn Reef, although outcropping on this property, giving shows of about 5 dwts. on the outcrop and carrying up to 40 dwts. in its footwall leader (see Truscott's "Witwatersrand Goldfields," page 55—for Joel Reef read Van Ryn Reef)—has never been opened up. Were development

(17) SUB NIGEL, LTD.—(Continued).

proceeded with on this, the great Reef of the Far East Rand, instead of the mine having only 400,000 tons of payable ore reserves after 23 years of work, there would speedily be 4,000,000 tons or more, and in a few years an ore reserve of 9,000,000, like that of the Government Areas Mine, is quite possible. This estimate and these remarks will make it clear how the interests of shareholders in this mine are being sacrificed by the unreasonable refusal on the part of the Consolidated Goldfields to open up the Van Ryn Reef from its outcrop on the property. I commend a study of this estimate and that for the Southern Van Ryn Mine, and these remarks, to the writer in the *Financial Times* referred to in the Preface to this book; and I will call his attention to the fact that this mine, the Sub Nigel, the adjoining property to the Southern Van Ryn, is the only Goldfields mine on the Rand that pays a decent dividend, and it is paying that dividend on the profits from the Nigel Reef only.

Dividend, 2s. per share for year ending June, 1919.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(18) LACE PROPRIETARY MINES, LIMITED.

Control			Barnato, Bailey Dale Lace.
Capital issued, £382,000, cash £270,937 authorised ...			£1,500,000.
Property: Freehold farms, Droogefontein, 5,419 morgen, and Vlakfontein No. 26, 3,554 morgen. In this estimate only the mining rights on Vlakfontein will be dealt with.			
The Company should under the Gold Law obtain approximately 1,500 claims as mynpacht and discoverers claims, and should be able to lease a further 1,500 claims from the Government			3,000 claims.
Estimated payable tonnage per claim			10,000 tons.
Estimated payable tonnage in mine			30,000,000 tons.
Estimated recovery value per payable ton for whole area...			32s. 6d. per ton.
Estimated value of gold in mine			£48,750,000.
Estimated profit per payable ton, Van Ryn Reef ...			12s. 6d.*
Total market valuation at par			£1,500,000.
Estimated profit on mine, £18,750,000, divided as follows:			
	To Government.	To Company.	
In respect of the Company's own claims—			
£9,375,000, less 10 per cent. Profits Tax	£937,500	£8,437,500	
In respect of 1,500 claims to be leased from the Government— Government participation. Estimated after allowing for amortization to Company and including the 10 per cent. Profits Tax	£2,812,500	£6,562,500	
	£3,750,000	£15,000,000	£15,000,000.
Estimated gross return for each £1 invested at par ...			£10.
Estimated profit after return of each £1 invested... ...			£9.

Estimated life of the mine is 30 years.

Present value (end 1919) of £1 share on basis of above estimate of profits, to give return of the money invested and 10 per cent. interest per annum for full life of mine, assuming that full production is reached January, 1925; first dividend end of 1925, is £1 19s. On the same basis the value of the £1 share on the 1st January, 1925, will be £3 2s. 9d.

*The estimate of 12s. 6d. per ton profit for this mine is based on the 16s. 8d. per ton for Springs Mines and the12s. 6d. per ton for Brakpan, allowing for rather higher working costs for this mine owing to its greater depth. See estimates for Springs Mines and estimate and footnote to Brakpan. This property has the additional potential value of the possibility of the Central Rand Main Reef Series being located on its western portion at comparatively shallow depth below the amygdaloidal diabase. See footnote to Spaarwater, following.

(18) LACE PROPRIETARY MINES, LTD.—(Continued).

The Company holds, in addition to the other properties above mentioned, which are not taken into account in this estimate, the Vlakfontein Mine only being dealt with, 252,000 fully paid-up £1 shares in the Spaarwater Gold Mining Co., Ltd. Droogefontein, stated to be valued at £100,000 surface value, must be calculated as a further asset.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(19) SPAARWATER GOLD MINING CO., LTD.

Control	Barnato, Bailey, Dale Lace.
Capital, authorised	£1,700,000.
300,000 issued for property. 400,000 guaranteed at par.	
500,000 under option at par for 4 years.	
500,000 under option at 22s. 6d. for 6 years.	
Total cash, £1,462,000.	
Mining rights over 5,718 morgen of Spaarwater, which under the Gold Law should entitle the Company to approximately 2,000 mynpacht and discovery claims. To which probably will be added another 1,500 claims obtained under lease from the Government...	3,500 claims.
Estimated payable tonnage per claim, Van Ryn Reef ...	10,000 tons.
Estimated payable tonnage in mine	35,000,000 tons.
Estimated recovery value per payable ton	30s.
Estimated value of gold in mine	£71,093,750.
Estimated profit per payable ton	12s. 6d.
Total market valuation at par	1,700,000.
Estimated profit in mine	£21,875,000.
divided as follows :—	
To Government participation. To Company.	
Estimated after allowing for amortization and including the 10 per cent. Profits Tax £4,375,000 £17,000,000	£17,000,000.
Estimated gross return for each £1 invested at par ...	£10.
Estimated profit after return of each £1 invested... ...	£9.

The estimated life of the mine is 30 years.*

Present value of £1 share on basis of above estimate of profits. to give return of the money invested and 10 per cent. interest per annum for full life of mine (assuming full production January, 1925, first dividend end 1925), is £1 19s. On the same basis the value of the £1 share on the 1st January, 1925, will be £3 2s. 9d.

*There are indications that the outcrop of Central Rand Main Reef Series may be found immediately below the surface on the western portion of this farm. Pieces of banket carrying payable values in gold have been ploughed out of the lands. The discovery and opening up of the Main Reef Leader in this position would serve two useful ends : first, it would give the *coup de grace* to the "One Reef" theory, and, secondly, it would add materially to the value of Spaarwater as a gold and profit producer. See footnote to Lace Proprietary estimate.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(20) HOUTPOORT, LTD.

Control				Sauer-Bleloch.
Capital authorised, 3,000,000 2s. shares				£300,000.
Of which 2,000,000 shares issued.				
Property: A. Mineral rights of 786 morgen, Klippoortje, and prospecting contract over Tulipvale, 359 morgen, with the right to purchase the freehold, including mining rights, for £12,000. The mynpacht on this farm is already granted and extends over 159 morgen = 238 claims.				
B. Prospecting contract over 750 morgen, Goedverwachting (Jacobs portion), with right to purchase mineral rights.				
C. Freehold of 377 morgen, Houtpoort Farm, and mineral rights over a further 236 morgen of same farm.				
Dealing with properties under Group A, the Company should obtain as mynpachts and discoverer's claims approximately 262 claims in respect of Klippoortje and 238 in respect of Tulipvale, total 500 claims, out of a total claim area on this group of farms of about 1,700 claims, leaving 1,200 available for leasing from the Government; assuming that the Company should obtain a lease over these claims on approximately average terms on which other leases have been granted under similar circumstances, *e.g.*, Modder East, and similar to those estimated for Spaarwater and Lace Proprietary Mines, the following will be the estimate: Claim area				1,700 claims.
Estimated payable tonnage per claim—				
Van Ryn Reef			10,000	
Nigel Reef			3,000	
Estimated total payable tonnage in mine on 1,350 claims carrying Van Ryn Reef and 1,700 carrying Nigel Reef, say, 13,500,000 Van Ryn Reef, and 5,000,000 Nigel Reef, total				18,500,000 tons.
Estimated recovery value of gold per payable ton—				
Van Ryn Reef			30s. 0d.	
Nigel Reef			40s. 0d.	
Estimated value of gold in mine				£30,250,000.
Estimated profit at 12s. 6d. per payable ton, £11,562,500, divided as follows:—				
	To Government.	To Company.		
Estimated, inclusive of Profits Tax, after allowing for amortization of capital ...	£2,312,500	£9,250,000		£9,250,000.

On basis of above estimate of profits and of a life of 40 years (460,000 tons per annum), assuming that the capital is increased to £400,000 and that profits made from production on a small but gradually increasing scale during the years 1920, 1921 and 1922 will be put into capital expenditure and develop-

(20) HOUTPOORT, LTD.—(Continued).

ment, full production at the rate of 460,000 tons per annum from January, 1923, first yearly dividend end 1923, the present value (end 1919) of each 2s. share, to give return of the money invested during full life of the mine is 8s. 4d., and on the same basis the value of the2s.share on 1st January, 1923, will be 11s. 4d.

Houtpoort is an outcrop property, thus a comparatively small capital is required to bring the mine to the producing stage, and full production can be attained in a shorter time than with deep-level mines. Similar remarks apply to the present values of the shares of this property and of the Eastern Van Ryn and Modderfontein (No. 21) and Boschfontein (No. 22), which were applied to those of the Southern Van Ryn (No. 15).

NOTE.—In addition, there is the prospecting contract over 750 morgen of Goedverwachting, which, although it is 17 miles further south, contains both Nigel and Van Ryn formations at workable depth. The Company also holds its mynpacht and rights over a portion of the farm Houtpoort, and on the mynpachts, I understand, there is a rich patch of Molyneux Reef, partially developed. Whatever may be the value of these additional interests, they are over and above those taken into consideration in the above estimates.

DEVELOPMENT.

The reports for July and August, 1919, show that three incline shafts are now being sunk on the Van Ryn Reef; present depth about 60 feet; pannings show values of free gold 3 to 4 dwts. over 40 inches; assays of the footwall leader gave 16 dwts. over 4 inches and 24 dwts. over 8 inches. This leader is really the footwall portion of the reef, being separated from the main body by only 4 to 6 inches of sandstone, which is also gold bearing.

In view of the values obtained to begin with from the Van Ryn Reef in mines like the Modder East and Geduld, and very similar values even from great and rich mines like Modder B and Government Areas at their commencement, these values shown by the reef in these prospect shafts of Houtpoort, Ltd., must be considered above the average of initial development values for the Van Ryn Reef. The rich footwall leader, first located in the water shaft of this property, has now been found in several of the shafts of the Eastern Van Ryn on the Heidelberg Townlands adjoining, indicating its permanence throughout.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(21) EASTERN VAN RYN AND MODDERFONTEIN GOLD REEFS, LTD.

Control	Sauer-Bleloch.
Capital £150,000 in £1 shares, probably increased to £500,000 to take in additional claims referred to below and for further working capital	£500,000.
Claim area on Heidelberg Townlands, at present 1,151, but will probably be increased to approximately 2,250 by acquisition of further adjoining claims. This estimate is based on 2,250 claims...	2,250 claims.
Estimated payable tonnage per claim—	
Van Ryn Reef ... ... 10,000 tons.	
Nigel Reef ... ... 3,000 ,,	
Estimated total payable tonnage in mine on 1,700 claims containing Van Ryn Reef and 2,250 claims containing the Nigel	23,750,000 tons.
Estimated recovery value of gold per payable ton—	
Van Ryn Reef ... ... 30s. 0d.	
Nigel Reef ... ... 40s. 0d.	
Estimated value of gold in mine	£39,000,000.
Estimated profit at 12s. 6d. per payable ton, £14,843,750, say £15,000,000, less 10 per cent. Profit Tax, £1,500,000	£13,300,000.
Assuming that the capital is £500,000 and on the basis of above estimate of profits, and a life of 40 years (600,000 tons per annum) and assuming that profits from production on a small but gradually increasing scale during the years 1920, 1921 and 1922 will be put into capital expenditure and development; full production from January, 1923, the present value (end 1919) of each £1 share, to give return of the money invested plus 10 per cent. interest for full life of mine, is £4 16s. 4d. On the same basis the value of the £1 share on 1st January, 1923, will be £6 8s. 7d.	

DEVELOPMENT.

The following extracts are taken from the Consulting Engineer and Manager's reports of work done on the Company's property during the month of August, 1919:—

Western (old No. 2) Shaft has been sunk to 61 feet. The panning value over 60 inches at the face, being 5 dwts. of free gold.

Central Shaft.—This is a new shaft, about the centre of the property, and has been sunk 30 feet. The panning value over 40 inches at the face is 4 dwts.

Eastern Shaft.—This is a new shaft towards the eastern end of the Company's ground, and has been sunk 40 feet, the panning value over 60 inches at the face being 5 dwts.

The reef in all these shafts consists, as in the Houtpoort property, of a top leader, a middle portion of pebbly quartzite, and the bottom reef; the bottom reef being the rich footwall leader, panning from 10 to 20 dwts. over 6 to 8 inches. The ore is pyritic at the depth attained, and the panning estimates are of free gold only. Arrangements have now been made to sample and assay all future development.

(21) EASTERN VAN RYN AND MODDERFONTEIN GOLD REEFS, LTD.—(Continued).

The accompanying plan will show the position of the above-mentioned shafts and other smaller prospecting shafts, from which it will be seen that the Van Ryn Reef has been opened and proved throughout the holding of the Company, and that it is now only a question of development.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(22) BOSCHFONTEIN GOLD MINES, LTD.

Control		Sauer-Bleloch.
Capital, £75,000 in £1 shares, of which 34,500 are issued and fully paid		£75,000.
Property: 1,500 morgen mineral rights over the farm Boschfontein, equal to 2,250 claims, of which the Company obtain 500 as mynpacht and discovery claims, and will be in a favourable position to lease the remainder from Government		2,250 claims.
Estimated payable tonnage per claim—		
Van Ryn Reef	10,000 tons	
Nigel Reef	3,000 ,,	
Estimated payable tonnage in mine on 2,250 claims carrying Nigel Reef = 6,750,000 tons, and 1,500 claims carrying Van Ryn = 15,000,000 tons		21,750,000 tons.
Estimated recovery value of gold per payable ton—		
Van Ryn Reef	30s. 0d.	
Nigel Reef	40s. 0d.	
Estimated total amount of gold in mine		£36,000,000.
Estimated profit at 12s. 6d. per payable ton = £13,500,000, probably divided as follows :—		£13,500,000.
To Government.	To Company.	
Inclusive of Profits Tax and allowing for amortisation = £3,500,000	£10,000,000	£10,000,000.

Owing to the capitalization of this Company on a mining basis not yet being arranged, no estimate of present value has been calculated.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(23) NIGEL GOLD MINING CO., LTD.

Control ... ... Maritzburg.
Capital ... ... £220,000.

Area.—Freehold of farm Varkensfontein and large claim area on Nigel Reef, from which the Company has taken about £4,000,000 worth of gold, of which about £1,000,000 was profit. The Company holds a central deep level block of 346 claims, still intact. The value of these claims can be judged from the estimates for the Southern Van Ryn and Sub Nigel. Access to these central claims can be obtained from the old workings of the mine. These central claims contain both the Nigel and Van Ryn Reefs.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(24) JOHANNESBURG CONSOLIDATED INVESTMENT CO., LTD.

Control ... ... Barnatos.

This Corporation holds 182 claims adjoining the Nigel, Van Ryn, and Southern Van Ryn Mines. These claims have been held by the Corporation for 25 years. They contain both the Nigel and Van Ryn Reefs.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(25) ROODEKLIP GOLD MINING CO., LTD.

Control ... ... Newbury.
Capital ... ... £150,000.

This Company holds 187 claims adjoining the Southern Van Ryn Mine. The whole area contains the Nigel Reef and about 150 claims contain both the Nigel and the Van Ryn. The estimates for the Southern Van Ryn Mine, reduced proportionately for the smaller number of claims held, can be applied to this property. This Company also holds a prospecting contract, with right to purchase the mineral rights, of Greyling's portion of Goedverwachting, in extent 750 morgen.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

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(26) FAR EAST RAND MINES SOUTH, LTD.

Control ... ... Sauer-Bleloch.
Capital ... ... £175,000.

This Company has prospecting contracts, with rights to purchase the mineral rights, over large areas of Scikfontein, Sterkfontein, and Brakfontein, in the Heidelberg district, amounting in all to over 4,000 morgen, or 8,000 acres. These properties all have the Van Ryn and Nigel Reefs either outcropping or at very moderate depth.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(27) ABBEVILLE G.M. CO., LTD.

Capital ... ... £250,000.

This Company holds prospecting contracts, with rights to purchase the mineral rights of portions of Schikfontein (750 morgen), Kaffirskraal (335 morgen), in the Heidelberg district; these properties contain the Van Ryn series at an estimated depth of 1,000 to 1,200 feet, and the Nigel at 2,000 to 2,400 feet. In addition, the Company has similar contracts over Driefontein (No. 280), Barnards Kop, and Herpsfontein, total 3,240 morgen, in the Balfour syncline, in which also the above reefs are found outcropping or at moderate depth. The areas amount in all to 4,325 morgen, or 8,650 acres.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(28) LOMAH BANKET.

Capital ... ... £250,000.

The properties held under prospecting contract by this Company on the Far East Rand comprise two portions of Sterkfontein, in all 2,094 morgen, or 4,188 acres, containing the Van Ryn and Nigel Reefs at moderate depth.

SPACE FOR READER'S NOTES CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(29) ROPER RIVER.

Capital, 500,000 shares of 10s. each ... ... £250,000.

The properties of this Company in South Africa are also on the farms Sterkfontein and Shikfontein, in all about 450 morgen.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(30) HEIDELBERG ESTATES AND EXPLORATION CO., LTD.

Capital ... ... £150,000.

Properties.—The Company is virtually the owner of part of the freehold of the farm Boschhoek, and the mineral rights over the whole farm, near Heidelberg, through its holding practically all the shares in the Boschhoek Proprietary Company, Ltd. Boring operations by Dr. Sauer, recently completed, have resulted in locating both Van Ryn and Nigel Reefs.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(31) OCEANA DEVELOPMENT.

Capital (170,000 shares of 10s.)... ... ... £85,000.

Properties.—A large number of farms in various portions of the Transvaal. In the Far East Rand area, Eendracht and Koppieskraal, in the former of which a borehole has been sunk by Dr: Sauer, and the Van Ryn Reef series was struck at a depth of 2,625 feet, and the boring stopped in the Van Ryn footwall shales, which were cut at 2,773 feet. The No. 2 borehole on Boschhoek, on the same line of section as the Eendracht borehole, which was commenced above the Van Ryn series, which it cut, and continued down to the Nigel Reef, proves that the Nigel Reef lies between 1,500 and 1,600 feet below the Van Ryn in this section, and that its depth at the position of the Eendracht borehole will be about 4,100 to 4,200 feet.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(32) MODDER WEST GOLD MINING CO., LTD.

Control ... ... Rufe Naylor.

Capital, £200,000; issued, £125,000 ... ... £200,000.
In addition 50,000 deferred shares of 1s. each and £50,000 in debentures.

Property.—133 claims Vlakfontein (No. 168) (Van Ryn Estates).

The Tatham Reef has been opened 72 inches wide in three layers. The report for August, 1919, shows a value of 11½ dwts. over the full 72 inches for 300 feet of reef exposed. 6,000 tons developed, ready for stoping. Recovery value estimated at 40s. First output expected end of October from 10-stamp mill.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

(33) MOUNT ARABEL.

This property has recently been purchased for its mineral rights (Van Ryn and Nigel Reefs) by a London syndicate.

SPACE FOR READER'S NOTES. CAPITAL, DEVELOPMENT, MARKET QUOTATIONS, ETC.

OTHER PROPERTIES.

In the detached Balfour syncline area, containing the same Van Ryn and Nigel Reefs, the following properties are held :—

500 Claims, Wilgepoort	Far East Rand Mines Selection Co., Ltd.
Modderfontein, Malanskraal	Modderfontein Van Ryn South, Ltd.
Rooiwal	Bleloch.
Witpoort (portion)	Bleloch.
Malanskraal (portion)	Bleloch.
Vlakfontein	Coronation Freehold.

Active work is proceeding on the Wilgepoort claims of the Far East Rand Mines Selection South, where payable values have been established on the Van Ryn Reef. On Modderfontein and Malanskraal the Van Ryn Reef is being opened from its outcrop, and is showing encouraging results. On Rooiwal the Van Ryn and Nigel Reefs are both outcropping, showing good prospects from the surface.

In addition to the claim areas belonging to the companies dealt with in these estimates and notes, there are a number of properties on the Far East Rand carrying the Nigel and Van Ryn Reefs at workable depths, on which little or no development work has yet been done, nor has provision been made for the capital required to work them. No estimates have therefore been made for these properties. The companies holding areas are :—

Oceana Consolidated	(Welgedacht No. 27).
East Rand Mining Estates	(Grootvlei).
Marievale Nigel Estates	Freehold and Mynpachts (Marievale).
Lydenburg Gold Farms	(Vlakfontein No. 21).
Central Mining and Con. Goldfields ...	(Vogelstruisbult).
Consolidated Goldfields	(Grootfontein).
Amalgamated Proprietary and H.E. Proprietary	(Maraisdrift and remainder of Klippoortje).

There are also large claim areas on the Van Ryn and Nigel Reef in the Far East Rand not yet leased by the Government under the Mining Leases Act. These are mostly on the deeper deep level areas.

FAR EAST RAND MINES.—SUMMARY OF ESTIMATES.—DECEMBER, 1919.

Company.	No. of Claims Intact.	Payable Tons.	Gold Values.	Gross Profit.	Nett Profit.	Developed Ore.	Reserves.
		Tons.				Tons.	Dwts.
*New Kleinfontein ...	1,250	12,500,000	£15,000,000	£2,500,000	£2,200,000	1,437,000	6·28
*Van Ryn Estates ...	80	3,250,000	3,740,000	812,500	750,000	1,347,916	5·6
*New Modder	980	29,400,000	62,475,000	33,075,000	29,000,000	9,000,000	8·6
*Modder B	1,150	25,300,000	53,762,500	28,462,500	25,212,500	3,378,000	9·2
*Van Ryn Deep	545	10,900,000	23,162,500	12,200,000	10,800,000	2,445,760	9·0
*Modder Deep	287·5	8,000,000	16,000,000	9,000,000	8,000,000	3,450,000	8·8
*Geduld...	2,200	22,000,000	35,000,000	13,750,000	12,250,000	2,510,000	7·5
*Brakpan	3,000	37,500,000	61,000,000	23,687,000	17,482,470	2,718,000	8·7
*Government Areas ...	2,400	60,000,000	120,000,000	60,000 000	28,649,000	10,000,000	8·0
*Springs...	3,400	34,000,000	68,000,000	28,300,000	19,500,000	2,256,000	8·69
Modder East	2,350	20,000,000	35,700,000	12,125,000	10,000,000	850,000	8·0
New State Areas ...	2,050	30,750,000	57,648,750	26,900,000	10,584,000		
West Springs	2,236	22,236,000	36,133,500	14,000,000	7,540,000		
Daggafontein	2,059	30,885,000	56,600,000	19,300,000	16,300,000		
Southern Van Ryn ...	1,662	32,310,000	55,620,000	23,310,000	21,000,000		
*Sub Nigel	1,900	31,350,000	55,750,000	20,500,000	18,450,000	400,000	10·3
Nigel Van Ryn	257	1,275,000	2,709,375	1,434,375	1,280,948	12,000	8·0
Lace Props	3,000	30,000,000	48,750,000	18,750,000	15,000,000		
Spaarwater	3,500	35,000,000	71,093,750	21,875,000	17,000,000		
Houtpoort	1,700	18,500,000	30,250,000	11,562,500	9,250,000		
Eastern Van Ryn ...	2,250	23,750,000	39,000,000	14,843,750	13,300,000		
Boschfontein	2,250	21,750,000	36,000,000	13,500,000	10,000,000		
	40,506·5	540,656,000	£983,395,375	£409,887,625	£303,548,918		

During the last twelve months, for which complete returns are available, the eleven mines at present in the productive stage on the Far East Rand, marked above with an asterisk, gave the following results :—

Tons crushed, 6,388,480; total gold produced, £11,510,371; gross profits, £4,895,742.

These figures give a total yield of gold per ton £1 16s., and a percentage of profit to recovery 42·5; the estimates given above for the whole Far East Rand area give the same average yield of gold, but a ratio of profits to recovery of 40 per cent.

The grand total of £983,395,375 worth of gold from 40,506 claims is very near the estimate of "One thousand million pounds for us or Germany" made in 1917. More than the difference of £17,000,000 has been taken out by the eleven producing mines in the last two years.

The Government's share of the £409,887,625 gross profits, in virtue of the 10 per cent. Profits Tax and its participation in the profits of the leased areas, will come to over £100,000,000.

The summary shows an average of about 13,500 tons per claim of an average gold value of £1 16s. 6d., and a gross average profit of 14s. 10d. per ton. Working costs average £1 1s. 8d. per ton. This figure is brought up above the average of the Van Ryn Reef mines, by the inclusion of the Nigel Reef tonnages, which can only be mined at a higher working cost.

When the Van Ryn and Nigel reef-bearing claims, not taken into account in this estimate, are considered, the gold value of the Far East Rand syncline cannot be estimated at anything less than £1,500,000,000.

EXAMPLE OF DETAILED WORKING-OUT OF PRESENT VALUE OF SHARE CAPITAL.

The example taken is Modder Deep, with an issued capital of £500,000, an estimated life of 16 years, and a total profit of £8,000,000 distributable during that period. The present value of this capital (at the end of 1919) is calculated to be £3,912,500, making each £1 share worth £7 16s. 6d. The amounts in the left-hand column show the progressive reduction by repayment of the money invested year by year. Each year £500,000 profit is allocated, partly to pay 10 per cent. interest on the actual amount remaining in the investment and partly as redemption. It will be seen that at the close of the 16th year the profits are exhausted, the money originally invested has been repaid with 10 per cent. interest each year on the amount remaining invested. The small residue £2,695 represents the error of calculation by the use of logarithms and is less than 1-10th per cent.

Year.	The money invested.	Annual Interest at 10 per cent.		Redemption of the money invested.		Yearly distribution of profit.
1	£3,912,500 £108,750	£391,250	+	£108,750	=	£500,000.
2	£3,803,750 £119,625	£380,375	+	£119,625	=	£500,000.
3	£3,684,125 £131,588	£368,412	+	£131,588	=	£500,000.
4	£3,552,537 £144,746	£355,254	+	£144,746	=	£500,000.
5	£3,407,791 £159,221	£340,779	+	£159,221	=	£500,000.
6	£3,248,570 £175,143	£324,857	+	£175,143	=	£500,000.
7	£3,073,427 £192,657	£307,343	+	£192,657	=	£500,000.
8	£2,880,770 £211,923	£288,077	+	£211,923	=	£500,000.
9	£2,668,847 £233,115	£266,885	+	£233,115	=	£500,000.
10	£2,435,732 £256,427	£243,573	+	£256,427	=	£500,000.
11	£2,179,305 £282,070	£217,930	+	£282,070	=	£500,000.
12	£1,897,235 £310,277	£189,723	+	£310,277	=	£500,000.
13	£1,586,958 £341,304	£158,696	+	£341,304	=	£500,000.
14	£1,245,654 £375,435	£124,565	+	£375,435	=	£500,000.
15	£870,219 £412,978	£87,022	+	£412,978	=	£500,000.
16	£457,241 £454,276	£45,724	+	£454,276	=	£500,000.
	£2,965.			Total profit of mine		£8,000,000.

TABLE SHOWING VALUE OF MODDER DEEP SHARES EACH YEAR FROM DECEMBER, 1919, TO END OF LIFE OF MINE.

End of	£	s.	d.	End of	£	s.	d.
1919	7	16	6	1927	5	6	9
1920	7	12	2	1928	4	17	5
1921	7	7	4	1929	4	7	2
1922	7	2	1	1930	3	15	10
1923	6	16	4	1931	3	3	6
1924	6	9	11	1932	2	9	10
1925	6	2	11	1933	1	14	10
1926	5	15	3	1934	0	18	3

Modder Deep £1 shares having now been split into 5s. shares, the market prices given above should be divided by 4.

APPENDIX.

FAR EAST RAND SPECIMENS SENT TO LONDON, JULY 31ST, 1919, AFTER HAVING BEEN EXHIBITED PUBLICLY IN JOHANNESBURG.

Those who may wish to see these specimens in London will be able to do so on application to Mr. Robert Bleloch, 3, London Wall Buildings, City.

Specimen No.	1	Platkopje	Poortje, near northern boundary Tulipvale (Houtpoort).
,, ,,	2	Platkopje	,,
,, ,,	2a	Poortje	,,
,, ,,	3	Nigel Reef and Footwall Shale (Outcrop)	Molyneux (Footwall).
,, ,,	4		
,, ,,	5	Nigel Reef	Boksburg North.
,, ,,	6	,, ,, ...	Sub Nigel.
,, ,,	7	,, ,, ...	,, ,,
,, ,,	8	,, ,, ...	Nigel, Van Ryn.
,, ,,	9	,, ,, ...	Daggafontein.
,, ,,	10	,, ,, ...	Hex River.
			Note Red Jasper Pebbles in each specimen.
,, ,,	11	,, ,, ...	Nigel Van Ryn.
,, ,,	12	,, ,, ...	Daggafontein.
,, ,,	13	,, ,, ...	Sub Nigel.
,, ,,	14	Van Ryn Reef	S.V.R. Mine.
,, ,,	15	,, ,, ,, ...	,, ,,
,, ,,	16	,, ,, ,, ...	New Modder.
,, ,,	17	,, ,, ,, ...	Govt. Areas, Modderfontein F.
,, ,,	18	,, ,, ,, ...	Modder B.
,, ,,	19	,, ,, ,, ...	Wilgepoort.
,, ,,	20	,, ,, ,, ...	Govt. Areas, Modderfontein F.
,, ,,	21	,, ,, ,, ...	New Modder.
,, ,,	22	,, ,, ,, and Footwall	Geduld.
,, ,,	23	,, ,, ,, ...	Brakpan.
,, ,,	24	,, ,, ,, ...	Van Ryn Deep.
,, ,,	25	,, ,, ,, ...	Springs Mines.
,, ,,	26	,, ,, ,, ...	Govt. Areas, Modderfontein F.
,, ,,	27	Upper Leader, Van Ryn Reef	Southern Van Ryn.
,, ,,	28	,, ,, ,, ,, ,, ...	New Modder.
,, ,,	29	,, ,, ,, ,, ,, ...	Govt. Areas.
,, ,,	30	,, ,, ,, ,, ,, ...	Heidelberg Townl'ds.
,, ,,	31	,, ,, ,, ,, ,, ...	Southern Van Ryn.
			Striped agate pebbles.
,, ,,	32	Lowest Reef of Far East Rand, Kim. Ser.	Sub Nigel.
,, ,,	33	,, ,, ,, ,, ,, ,, ,, ,,	Brakpan.
,, ,,	34	,, ,, ,, ,, ,, ,, ,, ,,	,,
,, ,,	35	,, ,, ,, ,, ,, ,, ,, ,,	Langermann's Kop.
			Same as Rietfontein, contains white quartz pebbles only.

Specimen	No. 36	Egg-shaped Pebble Reef (Upper portion, Van Reef Series)	Klippoortje.
,,	,, 37	Egg-shaped Pebble Reef (Van Reef Series)	Van Ryn Estates.
,,	,, 38	Egg-shaped Pebble Reef (Van Reef Series)	,, ,, ,,
,,	,, 39	Egg-shaped Pebble Reef (Upper portion Van Ryn Reef)	Heidelberg Townlands (E.V.R.).
,,	,, 40	Egg-shaped Pebble Reef (Upper portion Van Ryn Reef)	Humphrey's Claims, Krugersdorp.
,,	,, 41	Van Ryn Reef (Outcrop)...	Klippoortje (Houtpoort, Ltd.).
,,	,, 42	,, ,, ,, ,, ...	Van Ryn Estate, adjoining New Modder.
,,	,, 43	Van Ryn Reef	New Modder.
,,	,, 44	,, ,, ,, ...	Klippoortje (Houtpoort, Ltd.).
,,	,, 45	,, ,, ,, ...	,, ,, ,, (Compare with Nos. 17, 16, 14—see colour of Iron Salts; also with No. 43—note smooth exterior of quartz pebble.)
,,	,, 46	Van Ryn Reef (Outcrop)...	Van Ryn Estate, adjoining New Modder.
,,	,, 47	,, ,, ,, ,, ...	Klippoortje (Houtpoort, Ltd.).
,,	,, 48	,, ,, ,, ...	New Modder (rich specimen).
,,	,, 49	,, ,, ,, (Outcrop)...	Klippoortje (Houtpoort, Ltd.).
,,	,, 50	,, ,, ,, ...	Rich specimen (7 oz. per ton), given by Mr. Schultz, Heidelberg, as coming from old shaft, Heidelberg Townlands.
,,	,, 51	,, ,, ,, ...	Klippoortje (Houtpoort, Ltd.).
,,	,, 52	,, ,, ,, ...	New Modder.
,,	,, 53	,, ,, ,, ...	Sub Nigel.
,,	,, 53a	,, ,, ,, (Outcrop)...	,,
,,	,, 53b	,, ,, ,, ,, ...	Area X (100 miles distant).
,,	,, 53c	,, ,, ,, ...	From street in Troyeville (Johannesburg.
,,	,, 54	Van Ryn Reef (Upper or Carbon Leader)	New Modder (rich specimen).
,,	,, 55	,, ,, ,, ,, ,, ,, ,,	Specimen contributed by J. Pirow, Research scholar on Rand Reefs.
,,	,, 56	,, ,, ,, ,, ,, ,, ,,	New Rietfontein.
,,	,, 57	,, ,, ,, ,, ,, ,, ,,	E.V.R. and Modderfontein G.R., Ltd., Heidelberg Townlands.
,,	,, 58	Buckshot Reef	New Rietfontein.
,,	,, 59	,, ,, ...	Troyeville (Johannesburg).
,,	,, 60	Blue Sky Reef	E.R.P.M.
,,	,, 61	,, ,, ,, Footwall Shale	,,
,,	,, 62	Main Reef Leader	Geldenhuis Estate Mines.
,,	,, 63	,, ,, ,, ...	Leeuwpoort, adjoining E.R.P.M.
,,	,, 64	Van Ryn Reef	Modder B.
,,	,, 65	,, ,, ,, ...	Rooiwal.

(1) Lowest Reef of the Far East Rand Kimberley or South Rietfontein Series. From Sub Nigel New Vertical Shaft.

NOTE.—Nearly all the pebbles are of white vein quartz of large size. This specimen is typical of the lowest Reef of the Far East Rand Kimberley (South Rietfontein) Series at every place where the Reef outcrops or has been opened up throughout a length of country of over 60 miles. Note the striking difference of this Reef from the Van Ryn.

(Photograph scale ½ linear actual size.)

(2) Van Ryn Reef (pyritic ore) (1) from Southern Van Ryn Reef Mine; (2) from Government Areas, Modderfontein Mine; (3) from Modder B Mine; (4) from New Modderfontein Mine.

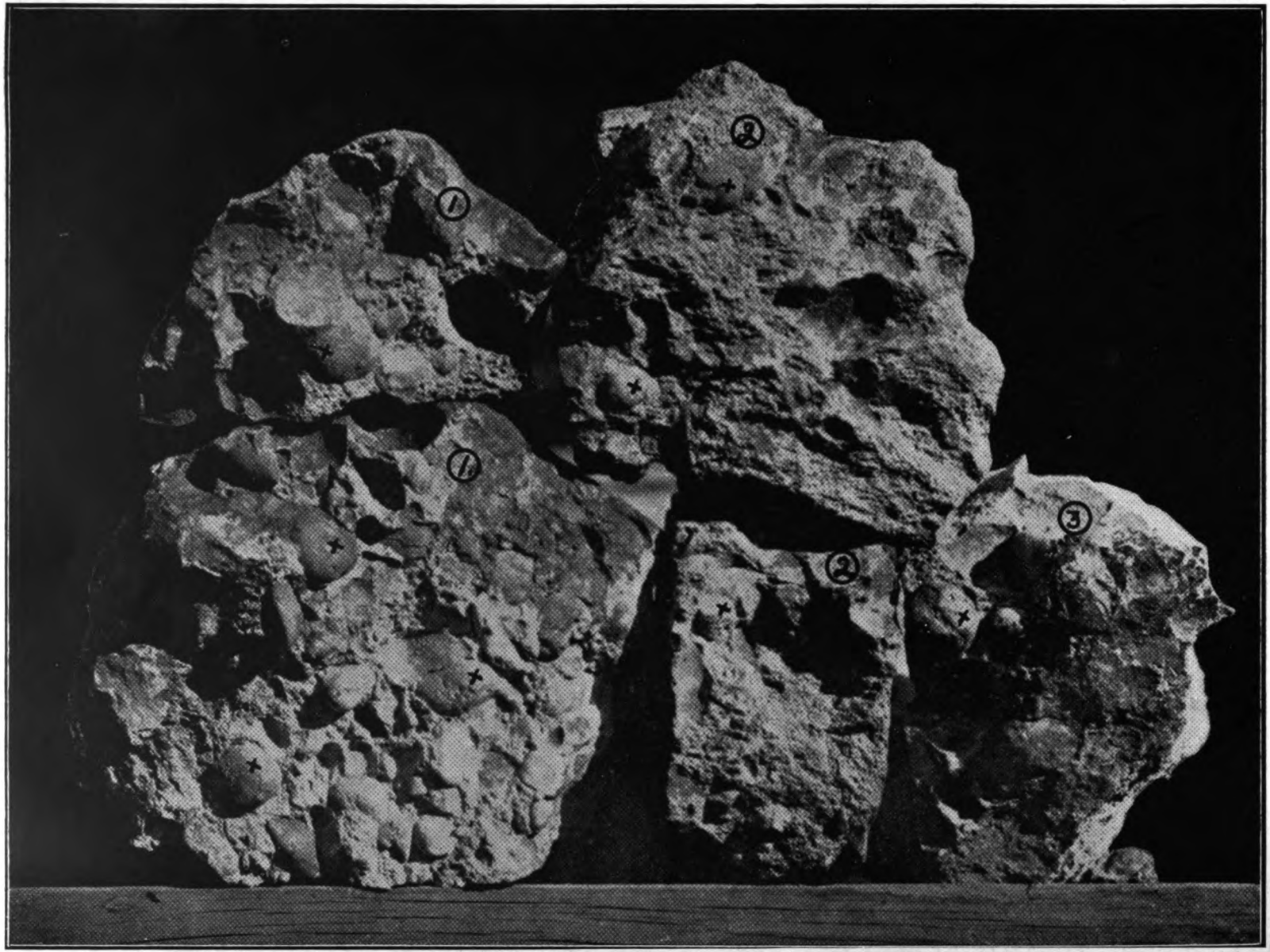
NOTE.—(1) The striped pebble (greenish grey stripes) peculiar to the Van Ryn Reef, not found in the Nigel Reef, marked ×. (2) Mottled grey quartzite pebble, marked ϕ (3) Glassy black vein quartz pebble, marked → plentiful in the Van Ryn, but absent in the Nigel Reef. The glassy nature of this pebble does not come out well on a photograph.

(Photograph scale 2-5ths linear actual size.)

(3) Nigel Reef (pyritic ore). (1) Nigel Mine; (2) Sub Nigel; (3) Nigel Van Ryn; (4) Daggafontein.

Note the preponderance in all the specimens of white and whitish grey vein quartz pebbles, mostly of small size. Note the absence of the black glassy quartz pebbles and the grey striped pebbles of the Van Ryn. The specimens came from mines on the Nigel Reef covering a distance of about eight miles, and are representative of the Reef being mined in all of them.

(Photograph scale 2-5ths linear actual size.)

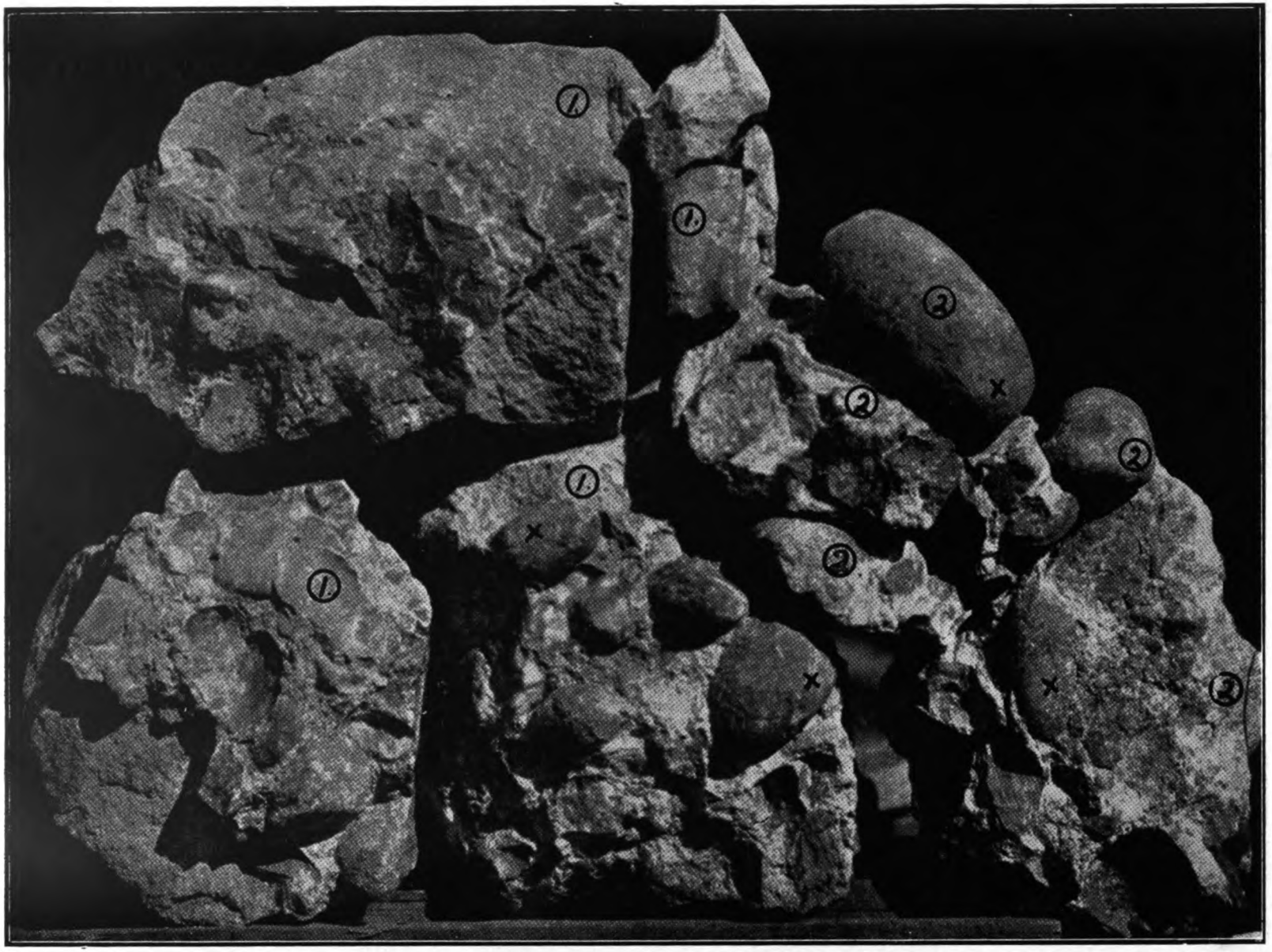


(4) Van Ryn Reef Footwall portion outcrop specimens : (1) Van Ryn Estates, New Modder outcrop; (2) Heidelberg Townlands, Eastern Van Ryn, and Modderfontein Gold Reefs, Ltd.; (3) Klippoortje, Houtpoort, Ltd.

Note the rounded smooth surfaces of the pebbles marked with a ×. These pebbles are typical of this lowest Banket body of the Van Ryn Reef Series wherever it has been found. The specimens come from outcrops of the Reef covering a distance of 30 miles.

(Photograph scale ½ linear actual size.)

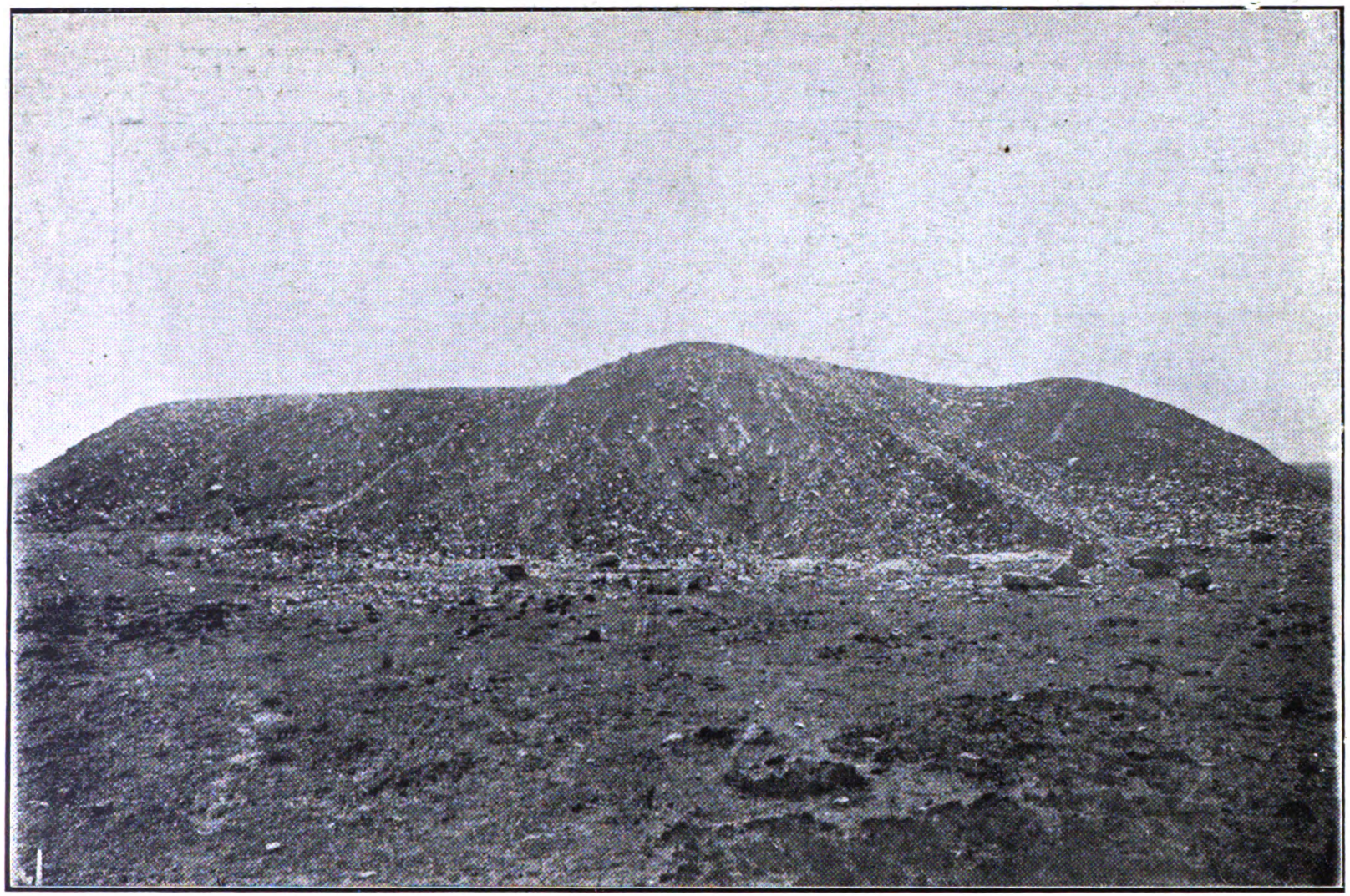
(5) Van Ryn Reef, upper portion, outcrop specimen from Van Ryn Estates—New Modder outcrop. This Reef body is known on these mines as the "Egg Shaped Pebble Reef." Egg shaped pebbles marked ×.
(Photograph scale ½ linear actual size.)



(6) Van Ryn Reef, upper portion (the "Egg Shaped Pebble Reef"): (1) from Klippoortje (Houtpoort, Ltd.); (2) from Heidelberg Townlands (Eastern Van Ryn and Modderfontein G.R., Ltd.). Egg shaped pebbles marked ×.
(Photograph scale ½ linear actual size.)

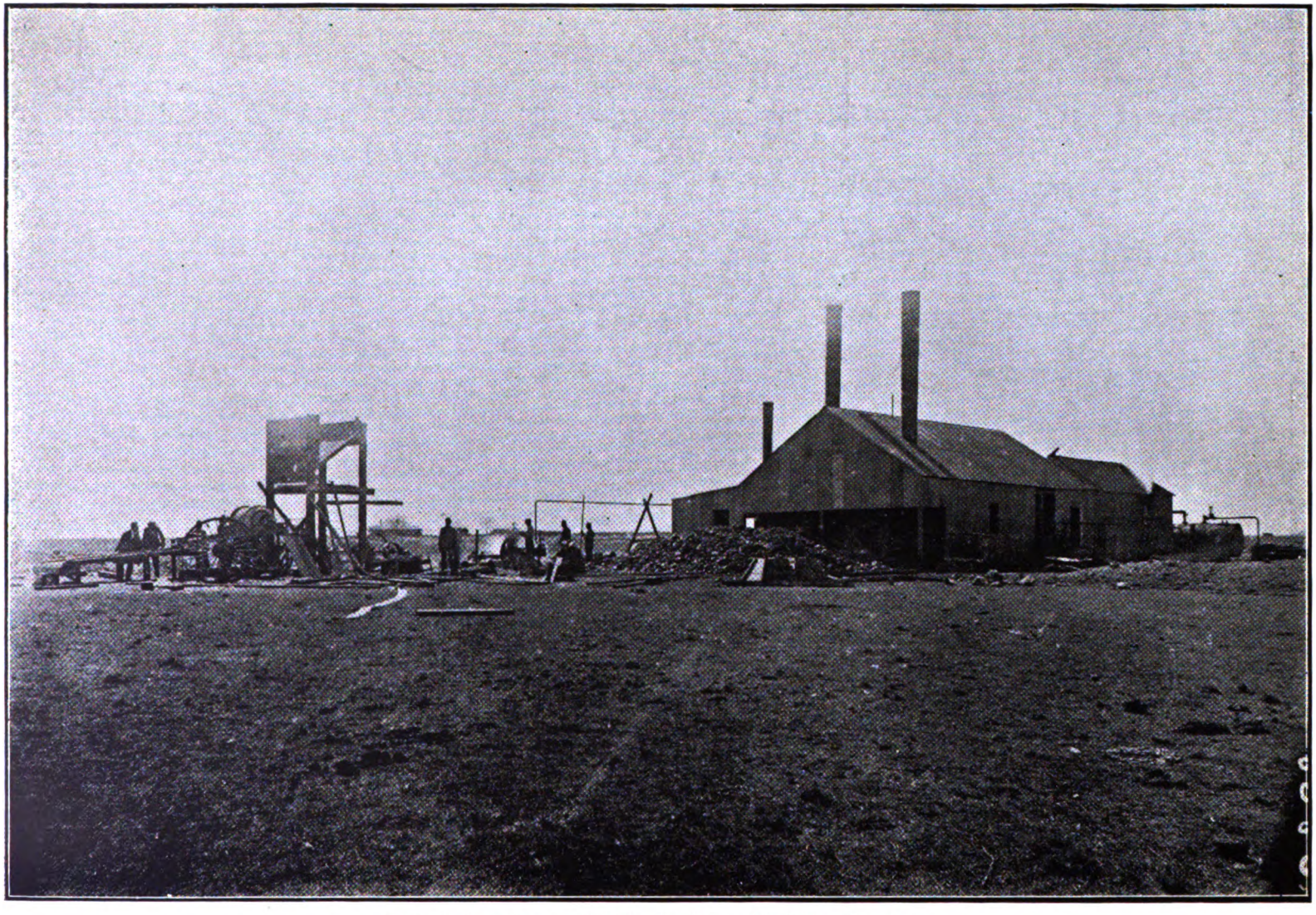
(7) Van Ryn Reef (upper portion): (1) Humphrey's Claims, Krugersdorp; (2) Klippoortje (Houtpoort, Ltd.).
Note the large egg shaped pebbles. All three specimens in this photograph show visible gold. These specimens came from positions 60 miles apart.

(Photograph scale 2-5ths linear actual size.)

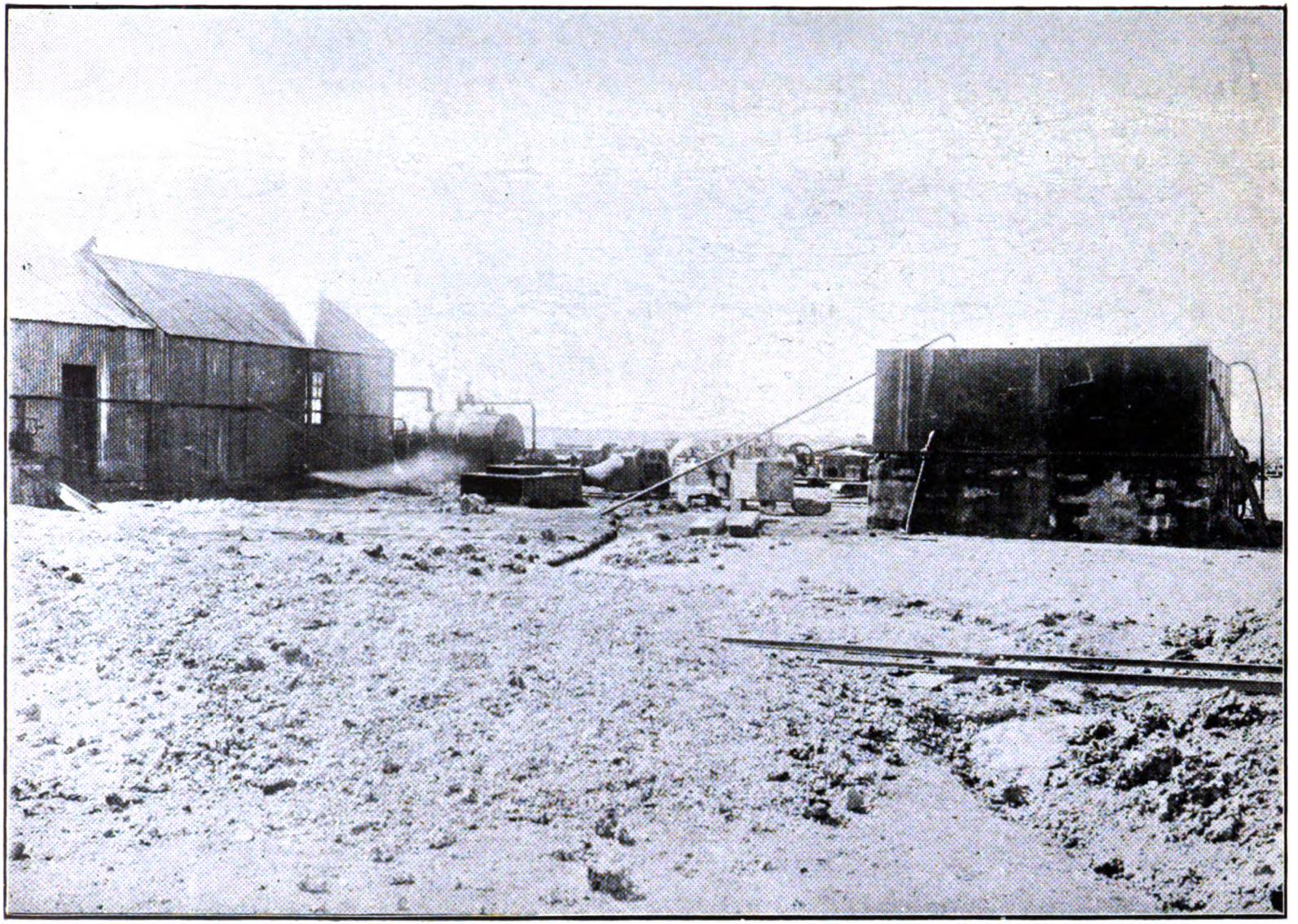


(8) Dump of Van Ryn Reef, Henderson Nigel Shaft, Southern Van Ryn Mine.

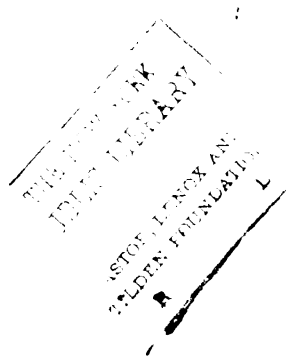
(9) *Headgear and Incline Shaft, Nigel Van Ryn Mine.*

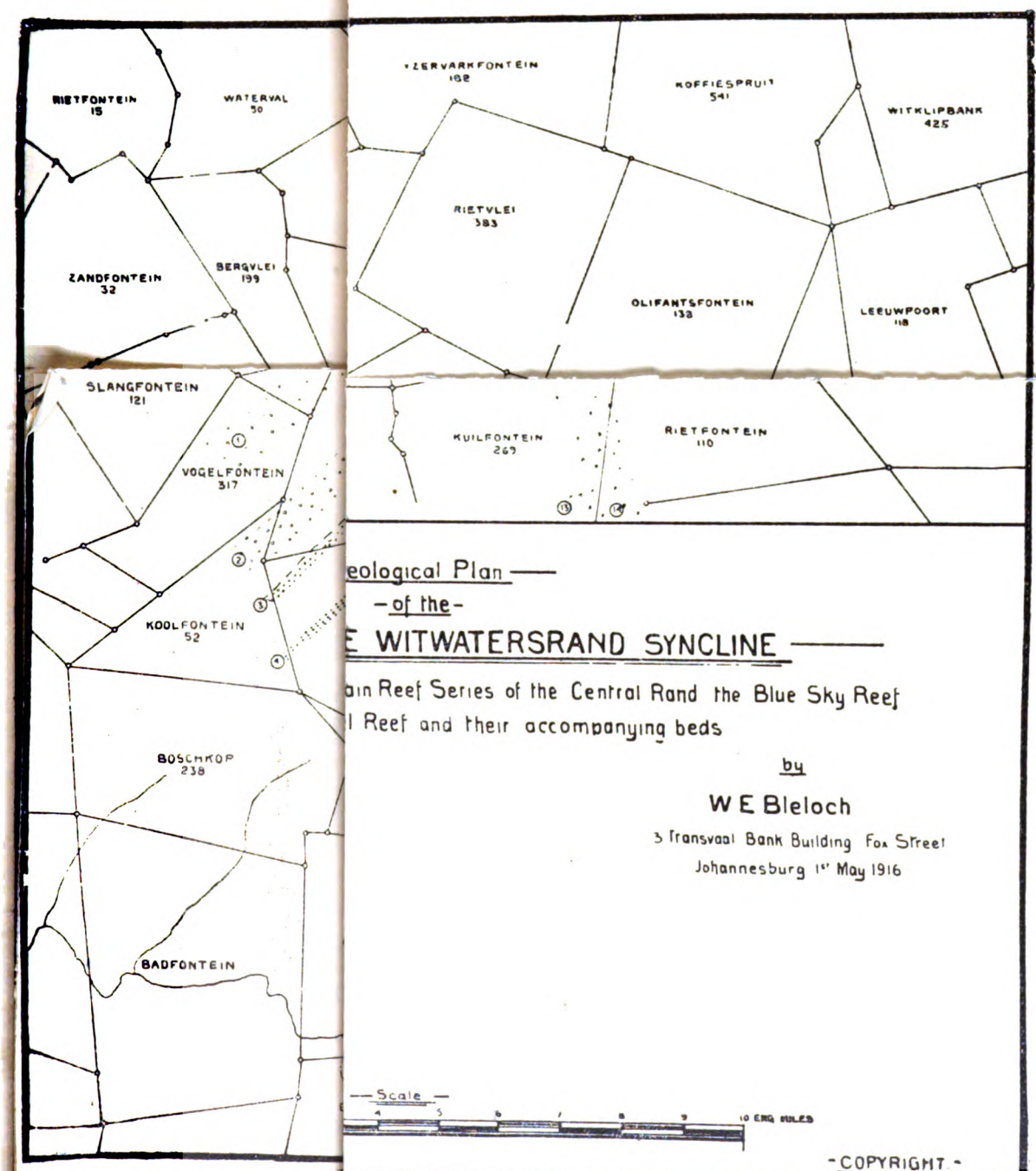


(10) Engine House and Reduction Plant, Nigel Van Ryn Mine.



(11) Compressor Plant, Nigel Van Ryn Mine.





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