# The Rationale of Investment IN ZINC MINING

BY
OTTO RUHL

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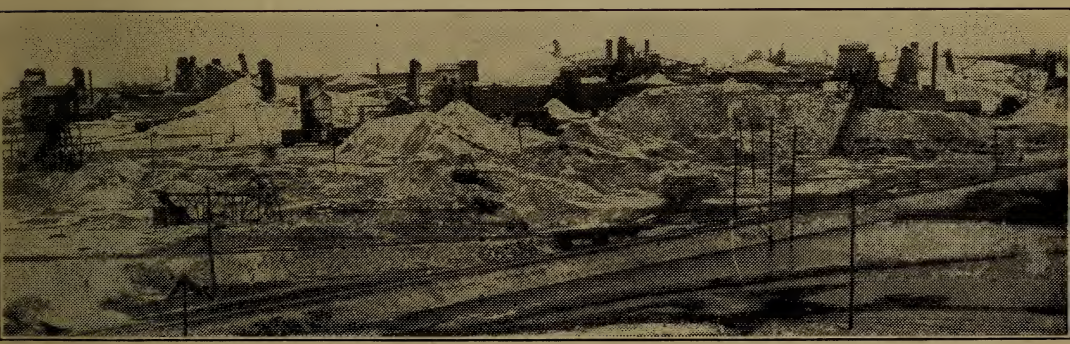
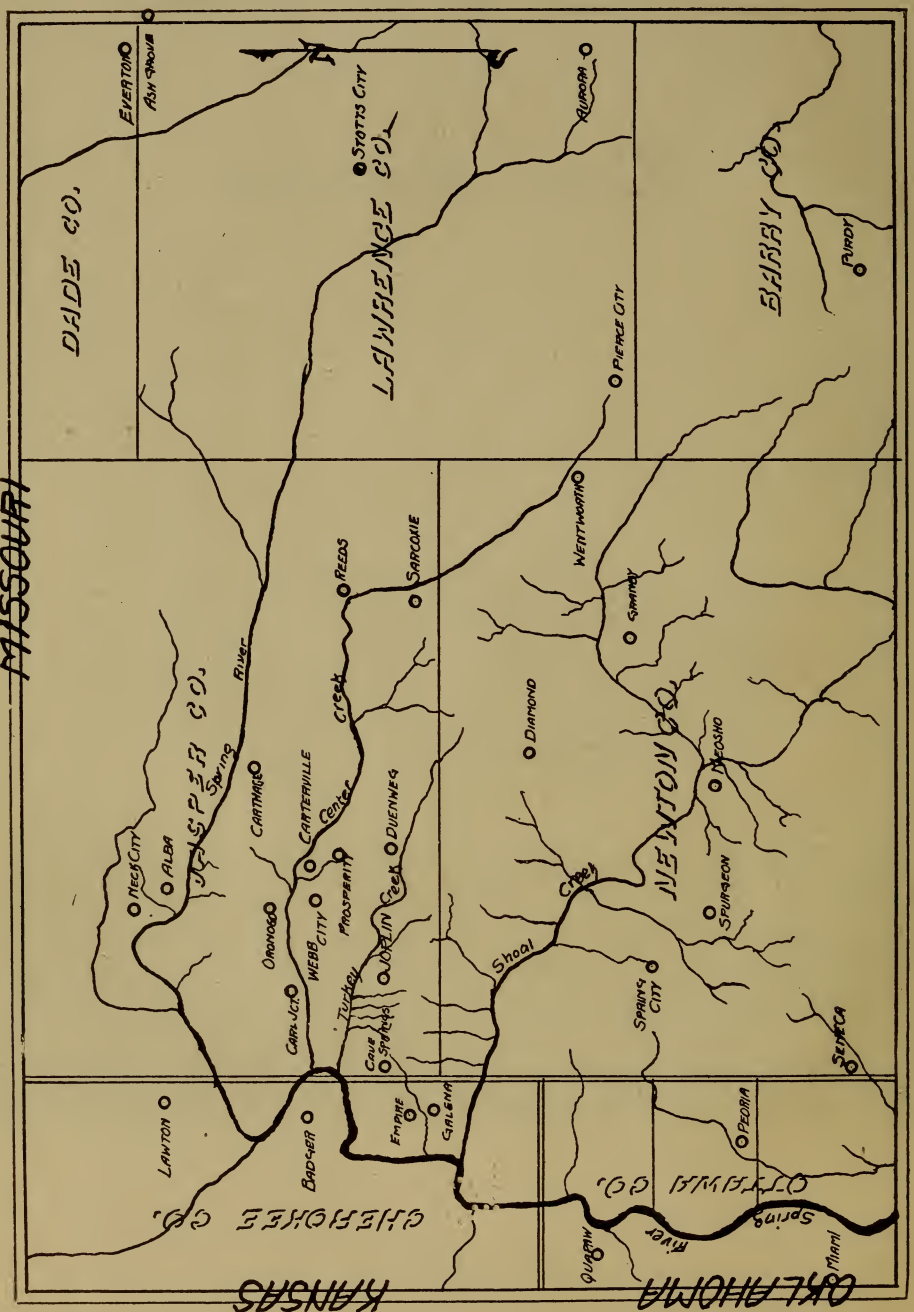




MINING NEWS CO. UNITED FARMERS TRADES UNION LABEL COUNCIL 3 JOPLIN, MISSOURI

# Outline Map of Joplin District



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LOCATION OF TABLES

# INTRODUCTION

In the preparation of the chapters of this book which were originally written for publication and appeared as a running series in the Joplin Daily Globe, particular attention was given to a concise and yet comprehensive treatment of the various topics which enter into the merits of investment in zinc mining. The various phases of investment were taken into account as fully as they suggested themselves, not only from the point of view of the favorable impressions, but as far as possible from the critical point of view. It was recognized from the very start that every avenue of investment has its demerits as well as its merits and that often its demerits may be corrected if the real causes are fully recognized and the remedies known.

The idea of collecting the whole series of articles suggested itself as perhaps furnishing the first attempt to place in a concise and readable manner not only the opportunities that exist in the zinc industry, but in a small way the actual conditions that confront the industry's future. Some of the problems are here disclosed on parallel pages to the opportunities presented. Neither all of the opportunities nor all of the problems are discussed but it is intended that the chapters contain the rudiments of a text book from the investment side of the industry. The various kinds of mining, the conditions found in each instance, the best methods of management, the pitfalls to be encountered, the processes that have proved successful for certain problems of mining, milling and management, are all touched upon, not with the idea of complete delineation but only suggestively and for the reading of the man who is searching for the suggestions which may help him in his own way of working out his own problems. It is also concise for the benefit of a busy public. The different topics are placed in chapters and the book indexed so that the busy man can turn to the particular topic in which he is interested.

In addition to the method of treatment of the various phases of zinc mine investment, it has been the intention to scrupulously avoid any mistake in the statement of facts. The zinc industry has reached an importance which is amply sustained by the facts and for that reason it needs no embellishment but the plain truth. The industry has attained a dignity to which those in it must subscribe respect and any statements about its opportunities and its problems should be expressed plainly instead of in hyperbolic fancies.

To the book are added tables showing the prices paid for ore and spelter for a period of years. A table is given also which shows the production and value of the Joplin District for a period of consecutive years. There is also a map indicating the respective centers of production in the states of Missouri, Kansas and Oklahoma.

Joplin, Mo., Jan. 27, 1910.

# CHAPTER I

## IMPORTANCE OF THE ZINC INDUSTRY.

A complete understanding of the importance of any industry by the men engaged in it, where the understanding is based entirely upon the real facts, instills a certain pride and confidence, not only in its leaders, but the very rank and file of its workers, which eventually gives greater efficiency and promotes its further growth. So long as an industry has in it the personal effort, the actual thoughts and deeds of men, the products of that industry inspire its workers with pride and zeal. From the first maker of Damascus steel to the present day the steel workers of the world have taken pride in their work and today no industry has more loyal workers.

The zinc industry has been one of such rapid growth that those engaged in it have not as a whole grasped its real importance in the industrial world. Few people know that the production of spelter in the world in 1908 only lacked 17,000 tons of being equal to the world's production of copper. Yet everyone has been impressed with the importance of the copper industry. It is true that the value of the two outputs differed greatly, the copper value being practically three times as large, but the world's spelter value was equal to the astounding sum of $77,500,000. The actual tonnage of spelter was 799,644 tons. This represented a decrease of almost two per cent from the previous year, which had been the record year.

### PRODUCTION AND CONSUMPTION INDICATES STANDING.

A significant thing as showing the substantial foundation of the zinc industry lies in a study of the relation of the production to the consumption in 1908. This was a general panic year the world over, and spelter consumption was expected to fall off heavily. While production fell off practically 16 per cent in the United States consumption only fell off 6 per cent. Following the market features up through 1909, even with the report of a heavy surplus of metal on hand at the beginning of the year, before ten months had elapsed spelter manufacturers reported that the surplus was wiped out and that they were preparing to run their furnaces at full capacity. Such facts are evidence of great solidarity to the future of the zinc industry.

The production of spelter in the United States for 1909 not only showed remarkable gains but broke all previous records and the most optimistic hopes of those engaged in the zinc industry. The total production is estimated at 268,215 tons. The estimated consumption for the year is 285,765 tons. This latter contains a large part of the previous year's surplus and does not take into consideration the fact that of the apparent consumption a large part of the stocks held by metal brokers may be included in this total. But such growth only accentuates the importance of the zinc industry.

The United States has gradually forged forward in spelter production until in 1907 it took first rank, passing Germany, its nearest rival. In 1908, because of the greater industrial stagnancy in this country, it again fell back to second place, but advanced to first place with this year's totals. For years Germany has held the head of the column. Its mining and smelting practice were the examples for the world. It passed easily ahead of Belgium, its nearest competitor for years, largely because of its supply of native ores, while England and France fell back to third and fourth place. The rapid rise of the United States and the passing of these old and established national industries has been due to the cheap fuels of this country and the great high grade spelter production of the Joplin district, which, with the numerous other localities in this country, has made it possible for the smelters to be independent of importations. Another fact contributing to the exceptional growth of the zinc industry in this country was the proximity of this cheap fuel to the ore deposits.

THE WORLD'S SPELTER PRODUCERS.

| Country. | 1907. | 1908. |
|---|---|---|
| United States | 249,860 | 210,424 |
| Germany— | | |
| Rhein District | 77,459 | 80,696 |
| Silesia District | 152,611 | 158,379 |
| Belgium | 170,307 | 181,910 |
| France and Spain | 61,438 | 61,533 |
| Great Britain | 61,286 | 60,049 |
| Holland | 16,526 | 19,023 |
| Austria and Italy | 12,522 | 15,680 |
| Poland | 10,635 | 10,752 |
| Australia | 1,098 | 1,198 |
| Totals | 813,842 | 799,644 |

Statistics mean little to the average man and yet the only way of comparing things or showing relative values lies in figures or percentages. For that reason the relative importance of the American zinc industry is shown in the above table. The world's production has grown 60 per

cent during the last twelve years, while the American production has almost doubled. Figured on the basis of the 1908 production, the United States furnished 26 per cent of the world's spelter. In 1907 its production was over 30 per cent, which will be approximately the amount for 1909, according to the present outlook.

The part that Joplin plays in the great zinc industry is the most vital point to the men in this district. You occasionally hear the bombast who praises the Joplin district to the skies. He many times lays claim to exaggerated facts about this field. Such exaggerations and their inevitable downfall are always hurtful and the district has suffered greatly from such evils. But the real facts are amply sufficient to give this field the premier place in the production of high grade spelter ores the world over.

### WHAT THIS DISTRICT DOES.

Returning to comparative statictics we find that the Joplin district in 1908 furnished 17 per cent of the world's output of spelter and in 1907 over 19 per cent. Of the American output the Joplin district supplied 63 per cent in 1907 and 64 per cent in 1908. These figures represent only the district's output that went into the production of metal alone. In addition to this there was a certain tonnage of ore that went into the manufacture of oxide which was comparatively unimportant but which should not be lost sight of in any estimate of the importance of the district as a center for the zinc industry.

The spelter from the Joplin district alone for 1908 was 136,520 tons, in 1907 158,304. This is greater than any other single area in the world except Silesia, Germany, which had for the corresponding years 158,379 and 152,611 tons of metal. It would appear that the amount credited to Belgium is also larger, but it should be remembered that the Belgian spelter is made up of ores imported from many countries, the Belgian native ores forming only a small portion of the ores smelted.

### A BIGGER TONNAGE OF ORE AND SPELTER.

The percentage of the Joplin district for 1909 will be greatly enhanced owing to the exceptional growth in the ore tonnage, as already demonstrated in the returns. For 1908 the output of ores was only 259,548 tons, while in 1909 the production was 300,000 tons, an increase of practically 40,000 tons in one year, equivalent to 20,000 tons of spelter.

### LARGEST MINING DISTRICT IN WORLD IS JOPLIN.

Another feature showing the importance of the Joplin district in the zinc industry is the magnitude of the mining operations carried on. Few people realize that the real

magnitude of mining operations depends upon the tonnage of crude ore hoisted out of the ground rather than upon the tonnage of concentrates sold from the bins. According to calculations made by the United States Geological Survey for 1907, the crude ore hoisted from Southwest Missouri mines alone was 8,097,108 tons. Adding to this the ore hoisted in the remaining camps of the district in Kansas and Oklahoma, the total should be in excess of 10,000,000 tons, or the greatest amount of crude ore hoisted in any single mining state of the Union. The nearest competitor would be Michigan with its crude copper ore, which is slightly less than ten million tons. Nor does this take into consideration the tonnage of dirt and rock hoisted as dead work in the opening up of new shafts and prospects. On this basis the Joplin zinc district represents the greatest mining district in the world. In the aggregate of its mining operations it therefore heads the list. Yet it is this very feature to which its own people are most blind, and which so appalls every mining man who first comes to the district after years of experience elsewhere.

## CHEAP FUEL A FACTOR.

That there seems a certainty of a still greater growth for the American zinc industry which will bring with it an increasing importance for the Joplin district is foreshadowed by the relation of cheap fuel to the ore deposits of this country. The great difficulty with the foreign spelter industry lies in the constantly increasing cost of fuel and the steady depletion of the known ore reserves, which means more and more dependence upon imported ores. In America the growth of the ore reserves is one of the most striking features in zinc mining, and cheap fuel is assured for a long term of years, especially in the coal districts adjacent to the Joplin and Wisconsin zinc fields. This feature alone means a tremendous growth of the zinc industry and a concentration of its greatest activity in these great zinc ore fields of the United States. That the Joplin district is now the greatest center for the industry is assured, but that its present importance is very small as compared with its future promise seems doubly assured by the conditions which are so strongly in its favor.

The relation of the zinc industry to the other great metal industries is one of vital import. The four great metal industries are iron and steel, copper, lead and zinc. These metals represent the basis for the industrial uses of the world. Of these, zinc is a close contestant for second place, and may eventually occupy it. When one understands that galvanized products are becoming more and more used, and that 66 per cent of all the spelter consumed is used for this purpose, it become more easy to see why the two industries are so interdependent. When one

is assured that every pound of brass has in it a certain percentage of zinc and copper, and that a majority of the bearings of all the machinery in the world is made of brass, one begins to realize the real importance of this metal to the mechanical world. Then the various alloys with copper, lead and other metals form a very important use. As zinc oxide mixed with white lead there is also a large consumption. All of these uses, it will be observed, are allied with the other great metals, and any increase of their use will help swell the consumption of zinc. These uses are sufficient to take up 75 per cent of the total production.

### AS AN INDEPENDENT METAL.

Of the uses independent of all other metals there is a wide range, and in these uses lies a field for still greater growth to the industry. Spelter has had no "electrification age" as has copper, yet its growth has been remarkable. If the metal can be given the attention it deserves at the hands of its friends the uses will be still greatly increased and its importance and necessity made more permanent. The greatest factor in its future growth is the cheapness of the metal in comparison with copper and aluminum, whose place and uses it can fill in many instances with just as great durability and at greatly reduced cost. With the growing cost of lumber, it will take a still greater part in all roofing purposes. These various uses have never yet been stimulated by the metal producers, but when this is done the metal will then take second place with the great industrial metals. That means that the zinc industry, which is the industry of the Joplin district, is second only to iron and steel, and as far as filling a place in the industrial world is concerned is just as important.

Surely if occupying the premier place in a great American industry which has by its wonderful growth surpassed all its competitors should swell the breast with a justifiable pride, then the man interested in the making of the zinc industry in the Joplin district has that right. Being thus interested in a great industrial necessity whose future seems certain of a still greater growth and importance, the confidence thus inspired should be a great asset in not only making but keeping the Joplin district the center of the American zinc industry.

# CHAPTER II

## THE SOLIDARITY OF ZINC MINING INDUSTRY.

## CHAPTER II.

Any industry may have certain periods of great prosperity, periods which arise from multifarious conditions, both local and general. Nearly every industry has in its history such periods to which are assigned the name of "boom periods," merely designatory of a fleeting and short-lived existence. These "boom periods," while bringing to certain elements prosperity, eventually result in utter ruin to the welfare of the industry as a whole. The "boom" is unnatural, there is nothing tangible behind it, and when there is any real pressure on the bubble it bursts, leaving dismay and chagrin behind.

The zinc mining industry has suffered from just such a boom period, and the marks of those trying days on the investing public still linger as scars, scars which retain their raw and irritated condition even with the passing of a decade of years. Yet with the passing of these years there has come to the industry a solidarity which places it upon a par with the excellence of any other industry that may be presented. Today the prospective investor is approached with an array of facts from which he can deduct the logical conclusion that there is a large legitimate profit in zinc mining. Formerly he was beguiled by the lurid claims of the "boom promoter." Between these two great periods there has been developed a real foundation upon which the future of zinc is being substantially reared.

The solidarity of the industry is based upon its growing uses of zinc in the industrial world. It now fills a real need. This need is becoming more insistent every year and the cumulative process means a greater growth indefinitely. Of course, there will be periods of general depression and the industry will have to bear its part as it did in past years. But having found its place, its future growth is but a matter of wise development by those managing the various enterprises engaged in it.

### ZINC A SAVING FACTOR.

There are several reasons why the zinc industry is now on a more solid foundation. One of the chief of these

lies in the fact that zinc belongs to that great class of natural products which makes for conservation, a saving or prolonging the use of things. The conservation idea is growing more and more because of the increasing cost of every commodity and the steady depletion of many natural products. Zinc, because of its indestructibility or resistance to oxidation, enters into the problem as a saving factor, and for that reason is highly desired where it can be properly utilized. As a covering for iron it stops rusting and thus lengthens the life of the article. For this use of galvanizing 66 per cent of all the spelter now being produced is utilized every year.

Every year the iron and steel industry grows greater. The ore reserves are becoming smaller and iron is growing dearer. Its protection, therefore, is a matter of growing interest and galvanizing for that reason alone is but in its infancy. Many articles now ungalvanized will be galvanized in the future. For instance, a few years ago all nails and steeples were drawn from iron alone and marketed. They were free to rust in 75 per cent of the uses to which they were put. Today a large percentage of them are galvanized. In the cases of shingle nails the nails themselves are made of spelter. The wire industry has been revolutionized by galvanizing and the saving to the world by zinc in this case alone is of tremendous proportions.

## NEW GALVANIZING METHODS.

But pure galvanizing, while filling a great place, has had some difficult things to overcome and for years could not be used in every respect where such use would have been eminently desirable. More recent discoveries in methods of coating iron with zinc has led to a hope of meeting these difficulties and thus greatly extending the use of galvanized iron. These new processes are known as electrozincing, cold galvanizing, sherardizing and cowperizing. In the use of the two latter methods a coating of zinc is placed on objects that even when broken or cracked by bending or abrasion does not allow rusting to take place. This property is due to the alloying of the zinc with the iron to a certain thickness. From this it is easy to recognize a great field for future development, especially when it is learned that these latter methods require less zinc to make the coating and there is no loss incurred as in the old hot method.

With such a close relation between iron, steel and zinc, the future of the zinc industry will be recognized as parallel to a large extent with the greatest metal industry in the world. The sales of iron and steel will become more and more a barometer of the trade conditions of zinc. The

higher the cost of iron and steel and their greater depletion, the greater the need for spelter will become, for conservation will be only the more necessary.

### ZINC USED AS SHINGLES.

Another feature where conservation will play an important part in the development of the needs for spelter lies in the use of sheet zinc or zinc shingles for roofing purposes in place of the rapidly diminishing wood shingle supply. That use has already reached considerable proportions in Europe and is growing rapidly in America, due largely to the rapidly diminishing lumber supply and the advance in the price of shingles. Yet with such an opening there has been no persistent or organized effort by the manufacturers of sheet zinc to occupy this important field. What has come has come through the natural demands of trade stimulated by the needs felt.

Here are but two great avenues for the consumption of spelter. There remain still the needs arising from the tremendous brass industry, which is also growing and taking a more important place in the industrial world. From these needs has been built up the solidarity which makes a firm foundation for the future prosperity of the entire zinc industry. The foundation is now recognized as firmly established, for the essentials are positive needs in the industrial world which spelter fills as no other product will fill it.

### WHY CONSUMPTION IS AHEAD OF PROGRESS.

Moreover, in this industry there is one great fact that insures for the producer of zinc ore and spelter a constant demand for the product. This fact would seem to insure that consumption of spelter will always be slightly ahead of production, especially as long as galvanizing takes such a great proportion of the spelter. This fact is, that of all the spelter used in galvanizing there is little or none ever returned for use again as scrap. When spelter is used in galvanizing, it is gone forever. And every year 66 per cent of the output is thus consumed. The only zinc ever returned for second use comes in old brasses or sheet. This is a very small percentage of the annual output, and as compared with other metals, like copper, lead and iron, forms a striking contrast. Everyone is familiar with the tremendous junk trade in those metals. The absence of any returned spelter to the channels of trade means that so far as the producer of raw material is concerned there is added only another great element of solidarity to the industry.

The years since the boom period of 1898 and 1899 have done many things for the zinc industry. The metal has become recognized as filling a certain place and as a necessary element in commerce. The needs it satisfies have been wonderfully increased. The profits between the

miners and smelters have been more equitably distributed and each is more nearly aware of the position of the other. Each recognizes that they are but component parts of one industry, that the welfare of both must be carefully guarded if either is to prosper long. The fog has cleared away and the industry now more nearly understands itself, and with this decade of growth and education now presents a field of opportunity for all who care to enter a field in which those who are now interested feel confident.

# CHAPTER III

## PROFITS IN ZINC MINING.

The question of the investor on coming to a zinc district is always, "Is zinc mining profitable?" The question is not only one which should be asked and answered truthfully, but the various reasons why it is profitable, and the concrete proofs of the mines that have been great profit-makers should be given in detail. The facts are amply sufficient to make zinc mining attractive without any addition in glowing statements which might not bear close investigation. The honest promoter or mining man will not hesitate to give these facts plainly, and nothing is more distasteful to the substantial men engaged in the industry than the bombastic operations carried on by the "curb-stoners" or "seatwarmers" with which every mining district is to a certain extent cursed.

The first proofs needed to show that zinc and lead mining is profitable lies in the great country built up from the industry since its inception. The Joplin district is covered with cities which in themselves are concrete examples of the substantial gains which have been obtained by the men engaged in the industry. These cities are equal to those of any other industrial community, and their rapid growth and advancement is the measure of the prosperity they have enjoyed. A population of 200,000 Americans, most of whom live in modern homes and in comfortable circumstances, certainly is the first proof that the industry in which they are engaged is a profitable one.

### VALUE OF YEARLY OUTPUT.

The value of the yearly output of the industry is also a criterion of no mean value. An industry which annually markets products to the value of $12,000,000 to $15,000,000 certainly presents opportunities for profit, or else the capital already engaged in it would seek other fields for investment.

But these are the generalities, the proofs which anyone should be able to discern but which sometimes are entirely overlooked, just because they are so palpable, so common, so taken-for-granted. Yet were these taken away the idea of profitable investment would not come so easy, and proofs more concrete would have to be submitted.

In the case of the Joplin district it is easy to submit the concrete proofs. Certainly the men who represent the district as its substantial business men, the men who now represent the investing class or leaders in all industrial movements, should form a very good exhibit of the prosperity to be gained in investment in zinc mining. The men of wealth through the zinc district will be pointed out almost universally as having made their wealth in mining or investment in mining lands, and what is perhaps most striking in such evidence is the fact that the majority of these men have risen from the very wielders of the pick and shovel. Of course, the pessimist is prone to say they are merely "lucky." But if such is the case, Dame Fortune is especially prodigal in the Joplin district.

## THE COST OF PRODUCTION.

But what about relative costs of production? What is the cost of producing a ton of ore? What investment will have to be made before there is a return upon it? Here are the questions that are really to the point and which the practical mining man takes pleasure in demonstrating. The answer lies wholly in the accumulated mining data from the companies which have been operating in the field for years. For instance, the mining men during 1909 took a careful canvass of the entire mining field during the tariff agitation to ascertain mining costs. These figures are as reliable as can be ascertained anywhere, as they comprise reports from many properties operating under all conditions throughout the field. From such data a fair average should be ascertained, as well as a knowledge of the extremes to be encountered.

Taking six of these mines as representative of the varying conditions to be found, the cost for the production of a ton of concentrate ranges from $28.08 to $44.91. They run along from $28.08, $33.67, $34.54, $36.83, $38.75 to $44.91. The average of the whole lot is $36.13. These mines are mines that had been operating from month to month. There were others, some with production costs very much below the minimum here taken, but they were not taken into consideration because the bulk of the mines had costs more nearly within the limits here shown. There were mines that showed a higher cost of production, but they were considered the failures, the impossibles. These costs represent the actual costs of producing the ore ready to ship, including royalty and amortization of the plant equipment.

## FIGURES SHOWING PROFITS.

Taking these as a basis of figuring the profits in zinc mining, at present prices of $50 to $52 per ton, it is ascertained the profit per ton on the lowest cost production is $21.92. On the others in their order the profits are $16.33,

$15.46, $13.17, $11.25, while the very maximum production cost still gives a profit of $5.09 per ton.

Here is a concrete case of a lease with a 200-ton mill upon it. The mill is run one shift per twenty-four hours. It recovers 3 per cent in concentrate. Its mining cost is $35 per ton of concentrate. Its initial investment was $35,000. With $50 ore its profits per week are $540. A year's run of forty weeks, allowing the remainder of the time for contingencies such as break-downs, fuel shortage, dead work and miscellaneous hindrances that will always arise in mining, gives an annual return of over $20,000. In two years' time the capital investment should be returned with an additional dividend. Given the average life of the mines in the district, it will yield three more years of continuous dividends.

The above is based upon present zinc ore prices. With a lower price for ore the profits diminish proportionately until the point is reached where labor costs are reduced and there is a readjustment in profits. The conditions here given are believed to be fair and conservative for the entire field. There will be other examples of larger mills, larger investments and lower production costs. There will be richer ore and hence lower production costs. There will be any number of variations, but the average mining in the district is thus demonstrated profitable where it is carried on as a business in a practical way. There are few investments which return the principal in so short a time and pay such dividends as zinc mining in the Joplin district where the investment is made along business lines.

### THERE ARE SOME FAILURES.

Let it not be understood that there are no failures. There are the usual number of failures in this industry that there are in others. They are due also to the usual causes plus those that come with the gambling spirit which seems to be so permanently fixed in the minds of everyone who first tries investing in mining. When the term "usual causes" was used, it meant the normal chances encountered in every business venture. It meant the incompetence which is so often the cause of money lost. It meant the lack of proper investigation in the investment previous to the paying of the money.

In addition, failure has come from trying to do a mining business through the employment of men unacquainted with that work. Success could scarcely come with an utter disregard of the principles of prospecting and mining as demonstrated by years of experience. Nor should one expect much when they invest money as a "flyer" without competent advice regarding the property from a mining engineer. There is just as much in the use of good common sense in investing in zinc and lead mining as there is

in a real estate investment, and only by the use of good common sense on the part of the investor will the number of failures be decreased.

The amount of investment which is necessary to enter this field is ridiculously small in comparison with other fields, yet there is open the possibility for very large investment. Perhaps there is no other mining field left where there is such latitude where the small man has just as much chance as the large one. Nor is there a field where large amounts of capital can find a more profitable return when invested with prudence and common sense.

# CHAPTER IV

## WHERE ORES ARE MARKETED WITHOUT COST.

The Joplin district presents the unique position of marketing its zinc and lead ores directly from the bins of the ore producers without having to pay freight or haulage from the mine to railroad or smelter, a privilege enjoyed by few classes of mines and few mining districts in the world. Contrasted with other fields where the mine operator has to haul his ore over long stretches of mountain road, sometimes being compelled to rely upon burros for transportation, the mine operator of the Joplin district is favored, for he sells his ore directly from the doors of his concentrating plant without having to give the matter any thought beyond ascertaining that he has obtained the best price offered for his grade of ore for that particular week.

What this means to the mine operator is readily recognized by even the untutored, for marketing costs for mine products eat up very rapidly the profits of mining. In the Joplin district there is no marketing cost in the largest central camps, only the very remote or outside camps ever having to spend a part of their earnings in getting their product to market. These last instances are very few in number compared with the bulk of the operators in the entire field. This means a vastly increased profit from mining operations conducted in this district. It means the substitution of profit instead of loss; it means placing the marketing cost upon the buyer of the ore instead of the seller.

### INDUSTRIAL EXPLANATION.

To the outside investor who understands the value of such procedure as cost of production, cost of marketing and other items which enter into an industrial enterprise, the topic of how and where ores are marketed and smelted presents some features which should make clear why zinc mining in the Joplin district when wisely and economically carried on is so profitable a business.

In the first place, the buyer of zinc ore comes directly to the operator's ore bins, secures a sample of the ore and assays it. He then makes a bid upon it. There may be two or three buyers who do this; they make competitive bids. The mine operator can sell his ore to whom he

pleases, and usually sells to the highest bidder. After selling the ore the buyer sends teams and wagons and hauls the ore, having it weighed over public scales, or often weighing it over the operator's scales and accepting his weights. If the operator has scales he can always check the weights of the other weigher, thus insuring himself against any loss. When the ore is loaded on the car the money is ready for the operator.

Settlements for the ore may be effected in two ways. If the buyer and seller choose they may settle on the first bin sample or they may sample the car after it is loaded, which is perhaps the best way to secure the best average for the ore, as through the loading process it is shoveled over and over again, thus mixing the ore thoroughly and making the grade fairly uniform. The sampling may be done in such a manner as to still further mix the ores. This sample is then split into three lots, one being taken by the buyer and one by the seller and a third taken and sealed to be used as an umpire sample if the two assays of the buyer and seller are so variant as to prevent settlement. If the two assays are reasonably close together the two parties split the difference. If the difference is so great as to make either party dissatisfied with such splitting, the umpire assay is run and the one most closely checked by this is used as the basis of settlement. There is in such methods absolute fairness.

## CONTRAST WITH OTHER DISTRICTS.

Contrast the above methods of selling ore with those in the west where metal mines are located. For the most part the mines are further away from transportation lines. The miner has to pay for the transportation from his claim or mill to the railroad, which in many instances is very costly. It often means the actual investment of thousands of dollars in road building before the operator can even haul his ores to the railroad. When that is done he puts it on board cars and ships it to some smelter. The smelter then has complete control of assays and after assaying it and deducting numerous penalties and charges sends a check for the value in—perhaps a month, two months or just whenever it gets good and ready. So dilatory are the western smelters in their settlements and so arbitrary in their methods that the entire western mining fraternity is constantly in arms over the outrages they have to endure. Joplin mining men who attend the American Mining Congress will remember that at every session the question is brought up. The meeting at Joplin was characterized by the bitterness of the feeling that the western miners exhibited against the methods of these western smelters. Apparently the miners have no way

of checking assays, weights or moistures against the assays of the smelters. All of this trouble the Joplin zinc and lead mine operator escapes with not only unruffled feelings but correspondingly increased profits.

### LEAD ORES ENJOY SAME ADVANTAGES.

What has been said of the selling of zinc ores applies with equal force to lead ores. The same advantages apply. The ore is purchased directly from the producers' bins on assays which are checked by the operator. There is no waiting for settlements; the money is paid just as soon as the assays are agreed upon. While there is not the competition for lead ores that there is for zinc ores in the Joplin district, previous experience has proved that the exceptional purity and grade of the concentrates has helped to make these ores highly desired, and the prices paid have usually been satisfactory.

Even the Joplin mine operator fails to recognize his advantages, largely because he has never felt the disadvantages. It means a great deal for an industry to have no direct marketing costs. That privilege is enjoyed by the Joplin zinc mining industry. This elimination of cost makes profits larger and makes it possible to mine many ore deposits which would otherwise be condemned. To the shrewd investor the fact that this industry has such advantages appeals with great force, and rightfully, for the Joplin district is unique in this respect.

# CHAPTER V

## ZINC ORE MARKET MADE IN JOPLIN DISTRICT.

When the bulk of the product of any industry is obtained in any one place, that place becomes the center of the industry, and around it will be grouped the movements and tendencies that enter into the making of its market. At that point will originate the basis price which becomes the standard for the remainder of the industrial world. For instance, Pittsburgh is the steel center of the United States, and the price of steel is made there, and so for other products that have one point of preponderating influence in either production or manufacture. This is practically a universal law of trade, and while the Joplin district has hardly awakened to its real importance in the zinc industry, it has unconsciously taken its place as the center of the source of the bulk of the raw material, and when the district becomes conscious of its power and influence in the making of prices for both ore and metal it will wield a power that will bring to it greater prestige and profits.

### FEW REALIZE THE ACTUAL CONDITIONS.

Few of the district's mine operators realize the opportunities that lie before it. On the other hand the zinc smelting interests of the United States not only recognize the importance of the Joplin district in the industry, but have openly pointed it out time after time. In the recent fight over the zinc ore tariff the smelters expressed a fear of the possible power to be exerted by this district, which was tantamount to admitting that if the district realized its power it could dominate the entire zinc industry. It was urged strenuously and of course with a great deal of bias in the contention that free ores were necessary to hold down the growing influence of the Joplin district in the domination of the zinc industry. While this argument was made for effect, the very fact that it could be made at all is sufficient evidence to indicate the respect in which the power of the Joplin district is held. It shows that the smeltermen recognize in the district one of the great controlling factors, even if the district itself has not yet awakened to that realization. And while the zinc mining industry of the district should not use its power to harm the zinc smelting industry, it should recognize its own

importance and power and assert its power for its own benefit and in the building up of both the zinc mining and zinc smelting industry of the United States.

In a general way the district's mine operators know that the Joplin district furnishes the largest production of zinc ores for spelter manufacture in the country, and as a mere phrase of high-sounding description or compliment they pass it along without giving the matter the serious consideration it deserves. The entire district should settle down and give the problem adequate attention.

### JOPLIN PRODUCES SIXTY PER CENT.

In the first place the districts that produce spelter ores for American smelters are Joplin, Wisconsin, New Jersey, Colorado, New Mexico, old Mexico, British Columbia and scattering camps throughout the Western states. Of these Joplin alone furnishes approximately 60 per cent of the entire amount. Taking the spelter output of 1907 as a basis for discussion, it will be found that the spelter ores needed were approximately 532,000 tons. This means a weekly demand of approximately 10,300 tons of ore. Of this amount there was secured 5,700 tons in the Joplin district, leaving the remainder to be secured from the other districts scattered over the country. This remainder of 4,600 tons, distributed among so many camps, some of them great distances from the others, accentuates the importance of the Joplin district as the great central field of ore supply. It becomes evident at once that the consumers of ore will direct the maximum of attention to the Joplin district.

This means that since this is the only district where such a bulk of ore is produced that it becomes the focal center of the industry. Its production alone is of greater importance than the combined production of the rest of the country. Whatever happens to the Joplin district affects virtually the entire industry. Let the production of Kentucky, or Wisconsin, or Idaho or Colorado be stopped for a week or a month, and the industry will go on comparatively unharmed, but let the production of the Joplin district be stopped entirely for even one week at a time and the effect is instantaneous. In the first instance the stoppage of production means a loss of 1,000 to 2,000 tons of ore, while in the case of Joplin the loss would mean 5,700 to 6,500 tons. Let the district shut down entirely for one month and the industry would be short one-twentieth of the year's ore supply.

### JOPLIN DISTRICT DWARFS ALL COMPETITION.

What does the ore surplus amount to in other camps of the country as compared with that in the Joplin district? If all of them were put together in one great camp

it would not equal the importance of that in the Joplin district, and when distributed over the United States in many small districts they dwindle into relative insignificance. Compare, if you please, 100 tons in Nevada, 50 tons in Montana, 30 tons in Idaho, 300 tons in Wisconsin and 1,000 tons in Colorado with 7,000 tons in the Joplin district.

Such facts as these indicate that the zinc ore market of the United States is made in the Joplin district, and the production and surplus of this field control in a very large measure the zinc industry of the country. It is a fact that many ore contracts in the West are based upon the ore prices prevalent in the Joplin district during the week the ores are delivered, while others are based on the price of the metal.

### ORE BUYERS ARE COMPETITORS.

Is it any wonder then that at certain seasons there is competition among the ore buyers that sends ore rapidly upward? Is it any wonder that outsiders who enter this field marvel at the competition exhibited for the ores in this district? The mine operators of this field have been so long accustomed to the competition that they often overlook it and at times believe sincerely that the ore buyers all act in unison. But while at times conditions may make it possible for buyers to co-operate for a while, the time inevitably comes when buying orders from the smelter headquarters means a struggle for the ores regardless of how it effects the other buyers. Were the Joplin mine operators compelled to sell their ores as do the Western metal miners they would quickly realize their advantages in this field.

These facts reveal a power existent in this field that means a still greater future for this district if its operators and future investors will but exercise their present advantages and recognize the power and importance of the field in the zinc industry. By co-operative action and unification of purpose along constructive lines it would be hard to foretell just the importance to which the district would rise. It naturally occupies a commanding position now and its natural growth, which is now very rapid, would place it still higher. But with such endless opportunity for development and with an awakened public consciousness in the real importance of the district in the industry, Joplin will mean to zinc what Pittsburgh means to steel.

# CHAPTER VI

## JOPLIN DISTRICT NEEDS CAPITAL.

In the development of any industry capital can play an important part, and for the use of capital the industry pays a certain percentage of its earnings in interest or dividends. The interests or dividends depend entirely upon the need of the industry for capital, and the demand for capital comes with insistent force in all growing industries. It has been noted that during the last few years the zinc industry has been growing very rapidly and the demands made for the metal have forced it into the front rank of the metal industries of the world. This great growth has brought with it a demand for capital which offers special inducements and the opportunities for the use of abundant capital in the Joplin district, where the return on the investment is exceedingly liberal, exist in almost limitless number in every camp.

But the man with money to invest says, "What do you want to do with the money invested?" The answers from the Joplin mining man come quickly. One wants sufficient capital to put up a milling plant on a developed prospect. Another, sufficient money to put in an adequate pumping plant to drain an already developed property which is now idle. Still another pleads for money to finish the drilling on a "forty" where he has already demonstrated a favorable mineral showing. Still another has the "forty" drilled and proven and desires the money to do the shaft sinking and development work. Others have large tracts of land absolutely virgin, but with no capital to test the merits of the ground. All of these needs are present, not in a few instances, but in numberless instances, in every camp in the district.

### INVESTMENTS MAY BE MADE IN ANY AMOUNT.

For certain classes of mining in the district there is need of varying amounts of capital to insure profitable operation. Where the ore deposits are shallow and the ore itself comparatively free from gangue the mining is very simple and the investment small. The poorest man can engage in this kind of mining. Where the deposits are deeper and water is encountered the cost of mining becomes somewhat greater and more capital becomes necessary. With greater depth comes the disseminated and

sheet ground deposits, which require more elaborate milling, and the initial investment becomes still greater. There are thus demonstrated gradations in the classes or sizes of investments which are necessary to be made in the development of mining enterprises in the district, and these gradations make room for every class of investor, from the very small to the very large.

As a concrete instance where capital has been needed to erect mills, may be cited the Galena camp. For years the small miners in that camp have been struggling without help. They have been getting out ore and hauling it long distances in a crude state to custom plants or selling it "in the rough" for a mere pittance, where if they could have gotten the capital required for a mill the profit from the additional investment would have yielded handsome returns to all interested. That capital is now finding this out is shown by the fact that contracts for many new mills on as many different leases have been let recently in that camp. Not only will there be greater profit from the savings brought about by milling the ores themselves, but there will be no loss hereafter in the haulage.

### BETTER MILLING PLANTS INCREASE DIVIDENDS.

Capital is also finding a profitable return in the provision of better milling plants, and hence better returns. The older plants, while blazing the way in the milling practice needed for the district, had many losses, and the new type of mill involving more capital investment is bringing a greater saving of the ore and hence a greater profit. Even the investment in the larger mills, which means handling a greater tonnage of ore in a shorter length of time, means a reduction in the cost of production. Within certain limits this increased size of mill and increase in investment is justified and brings its return to the investors.

But these instances merely indicate what capital is already doing and some of its avenues of operation. What is really important in showing the opportunities for capital lies largely in the profits of zinc mining already delineated in a previous chapter and the great areas of absolutely virgin territory awaiting the necessary development to produce zinc and lead. One of the most striking things to the visitor on first coming into the district is the vast expanse of territory that lies untouched between the various camps of the district. Why is it yet untouched? Simply because there have not been the men and capital to do it. But the development is steadily growing as rapidly as the capital and men undertake the work.

## PRESENT DEVELOPMENTS BUT DOTS ON THE MAP.

In the district there is approximately an area 90 miles long by 50 wide, within which there are located various centers of activity. These centers of activity are but dots on the map as compared with the area of undeveloped land around them. This area offers every possibility for developing into productive territory that the present camps did. Moreover, the development of this new territory has vast advantages over the first development in having the contiguous territory partly developed as centers from which to work.

In addition the development under more favorable circumstances today makes any investment much safer than were the earlier ones. Those early pioneer days were ones in which the very industry was feeling its way. Today the industry is in the very throes of hurried progress. The methods of development, prospecting, milling practice, have been solved to the extent that the industry is highly profitable to the practical business man. Today there is every facility in the way of supplies at hand. Railroads from a veritable network all over the territory to be developed. The entire field is a rolling prairie, or only slightly broken with low hills; not a point in the field is difficult of approach, or out of reach of a two hours' automobile ride from any camp in the district. Mining in the Joplin district is mining under the choicest industrial conditions enjoyed by any mining district in the world. Yet here are thousands of acres of land totally undeveloped. They may be secured by purchase and the investment will yield well. They may be secured under favorable leases, and the money expended judiciously in development of them will yield good returns. But whatever investments are made in the district should be made on the basis of further development of the lands into mineral producers. The returns on investment come from ore production, and investments should be made toward that end, whether they be in buying lands or in leasing them.

## FIELD IS OPEN TO EVERYONE.

What is also of interest to the future investor is that this field is yet open to everyone. The zinc mining industry is not yet consolidated. There is no trust that controls the bulk of the lands or output, as in copper or steel. It is still a "free field and a fair fight." In coming to the district with his capital he will be free from any fear of labor strikes, as the workmen are all Americans, who may be miners one day or operators the next, and for this reason serious labor troubles have never been known.

But in the investment of his money the capitalist must exercise judgment in this industry as in all others. He

must investigate the conditions surrounding his investment. He should see to it that he deals with and through reputable mining men. He should make his investment with all the care and advice a judicial investor makes in investing in manufacturing enterprises. When this is done capital will find not only great opportunities for profitable investment in the Joplin zinc district, but will find such investments eminently safe.

## AVERAGE MONTHLY AND ANNUAL PRICES FOR SPELTER IN ST. LOUIS FOR PAST TEN YEARS

| | 1900. | 1901. | 1902. | 1903. | 1904 | 1905. | 1906. | 1907. | 1908. | 1909. |
|---|---|---|---|---|---|---|---|---|---|---|
| Jan. | $4 43 | $3 89 | $4.14 | $4 67 | $4.73 | $6.13 | $6.40 | $6 65 | $4.43 | $5.00 |
| Feb. | 4 61 | 3 80 | 3.98 | 4 83 | 4 73 | 6 02 | 5.94 | 6.76 | 4.74 | 4.75 |
| March | 4 44 | 3.75 | 4.11 | 5 17 | 4 85 | 6.00 | 6.12 | 6.78 | 4 60 | 4.63 |
| April | 4 52 | 3.80 | 4 19 | 5 42 | 5 06 | 5.77 | 5 98 | 6 63 | 4 53 | 4 82 |
| May | 4.44 | 3.84 | 4 24 | 5.50 | 4.94 | 5.39 | 5.90 | 5.40 | 4.49 | 4.97 |
| June | 4.16 | 3.80 | 4 64 | 5 59 | 4 64 | 5 10 | 6.04 | 6 35 | 4.45 | 5.27 |
| July | 4 12 | 3.80 | 4 98 | 5 50 | 4.77 | 5.28 | 5 91 | 6.03 | 4 36 | 5 27 |
| August | 4.02 | 3 80 | 5 24 | 5 56 | 4 78 | 5 62 | 5.91 | 5 60 | 4 57 | 5 60 |
| Sept. | 3.33 | 3 87 | 5 24 | 5 65 | 4 96 | 5 75 | 6.11 | 5 16 | 4.64 | 5.65 |
| Oct. | 4.02 | 4.07 | 5.24 | 5.48 | 5 08 | 5 97 | 6 14 | 5.34 | 4 65 | 6.05 |
| Nov. | 4.13 | 4.12 | 5:08 | 5 04 | 5.37 | 6 02 | 6.29 | 4.93 | 4.95 | 6.27 |
| Dec. | 4 05 | 4 15 | 4 59 | 4 58 | 5 77 | 6 43 | 6 50 | 4 21 | 5 03 | 6 14 |
| Y'rly av. | $4 24 | $3 89 | $4 64 | $5 25 | $4 97 | $5.79 | $6.10 | $5 90 | $4 62 | $5.3 |

# CHAPTER VII

## ZINC MINING OFFERS OPPORTUNITIES TO POOR MAN.

The opportunities which exist in any industry are measured by the prosperity of the workers engaged in it. They are also measured by the rapidity of growth in the industry and the future outlook and development. Measured by such standards the zinc mining industry of the Joplin district offers a field which teems with opportunity for men of ambition and industry.

Throughout 1909 there was a steady call for labor which has not yet been answered by sufficient workmen to fill the places that need filling. One week there was a call for 2,000 workmen and 100 teams from one camp in the mining district. That call is just as insistent from many of the remaining camps, and the slowness of the influx of men to fill these needs is a brake on the wheels of the district's industry. With many mills still idle on account of labor shortage, and with many other plants desiring to put on a double shift, the opportunity for workmen alone is written in letters large enough to be seen half across the continent.

### WHAT LABOR DEMAND MEANS.

With such a demand for labor there is always a high wage scale, and the day in the Joplin district is again fast approaching when the weekly wage of the shoveler is almost, if not as large as the salary of the mine superintendent. Surely such demand is indicative of the opportunity now existent in the district for the laboring man alone.

The profitable condition in the zinc mining industry of the Joplin district, due to the present greater demand for ore and the consequent higher level of ore prices, also offers to the small investor or prospector a field for very profitable operation. The old shallow levels, so productive in the early history of the district, are still available in many parts of the field. To these deposits during the panic months many miners turned for their subsistence, and their trust was not in vain, for the sudden increase in the production of ore from this old source was so large as to attract the attention of everyone, and was one of

the reasons why, even with a panic of tremendous proportions, the output of the Joplin district suffered so little reduction in tonnage. The only assets necessary for the working of these deposits are a few picks and shovels, a little powder, a "hoss hister" or a mere windlass, a hand jig, and sufficient muscular energy and ambition to work a few hours per day.

NO INITIAL INVESTMENT IN MANY INSTANCES.

The ground is available for working upon a lease system which does not demand an investment of money, but the payment of a certain percentage of the returns when the ore is taken out and really marketed. The land available for such purposes is not nearly all taken up even in the confines of the old camps themselves, not taking into account the chances that a live prospector would have in prospecting new and adjoining ground. In the Granby, Joplin, Galena and Duenweg camps, which have been known as "poor men's camps," there are large areas which may be secured.

In this connection it should be noted that it is in these more shallow deposits, which are usually free in character and easily cleaned, that the cost of mining goes down to the very minimum and the amount of profit approaches the maximum. It was in this very character of mining that the present leading mine operators and wealthy men of the district made their first "stake." Nor is it it strange that today it is this very class of men who are the most eager to "grub stake" the miner in the development of such mines.

HOW THOSE OLD-TIME BONANZAS WERE FOUND.

It has been among this class of deposits that the great bonanza mines have been found. Those mines that in a few months' or a few years' time netted their owners thousands of dollars were found for the most part by the small operator or prospector or groups of such men associated together. Who has not heard of the tales of the old Dividend, the old Independence, the Hell Upon Earth, the old Octo and many in old Tanyard hollow, where the ore was found in such abundance and with so little expenditure of capital? The greatest assets the old developers of the district had were ambition and a capacity for work. Yet these investments alone made the early fortunes and inaugurated the great mining industry of the Joplin district. These opportunities are not all gone by any means, and a casual survey of the district's camps reveals surprising instances during the past year.

The early mining did not offer such a promise in profits as the mining of today. All the early fortunes were made on $14 to $30 "jack." Lead was somewhat

higher. The total amount received for the ore in those days was in many instances less than the profits on a ton of ore produced in the average mine at present prices. The difference in $20 and $50 ore gives a very large margin for greater profit, and the incentive for a greater development of these old-time free ore deposits should become very much stronger. The stake now ahead of the prospector in the search for such deposits is one of surprising size and should tempt a large influx of men who are searching for opportunities where brains and work are the principal assets to be offered. Where men offer these, together with a reasonable amount of ambition and pluck, the opportunities that remain in the Joplin district will be found almost unlimited.

### FROM MINER TO OPERATOR VERY COMMON.

It is a surprising fact that many miners in the Joplin district work a few months and then return to prospecting for this class of ore. If they are successful they need not work for wages any more. If they are unsuccessful or cannot complete the work before their stake runs out they sometimes go back to work for a while or take some other men into partnership who furnish the necessary money to complete the work. For years this policy has been followed by the miners of this district, and its results have placed many men, formerly only wage earners, among the operating class. The expression "A miner today, an operator tomorrow," is more than a mere rhetorical phrase in this field. It is the expression that opportunity still exists in this district for the small man, the prospector, the man whose only assets are brains, strength and ambition.

# CHAPTER VIII

## ZINC MINING OFFERS WIDE RANGE OF INVESTMENT.

Investment in zinc mining in the Joplin district stands in great contrast to investment in any other district and in any other kind of mining. This contrast is so great that it is striking even to the uninitiated and should mean a greater number of investments in this field when it is more generally known and understood.

In the first place investments here are open to the individual operator on both a larger and smaller scale than in any other field. For instance, the man with only a pick and shovel and energy enough to work can invest his work in actual mining and secure returns upon it. The man of moderate means can also find a place either by himself or in company with others. The man with a capital of $15,000 and upward can find places to operate independently. He can own a mine or mining fee all by himself without associating with any partners or making his company a stock concern if he so desires. The point is that in this field there is not needed vast aggregations of capital to begin operations or carry the operations to a successful issue.

### FEW BIG COMPANIES IN JOPLIN DISTRICT.

The number of operations involving the use of $200,000 in capital for a single enterprise are not as numerous as those involving lesser sums. Upwards of this figure the enterprises engaged in mining grow smaller in number and are confined mostly to the larger fee-owning and leasing companies rather than the operating class. So nearly has it become a law in this field for the operating companies to have small capitalizations that any new enterprise with unusually large capital stock is looked upon with suspicion if there is any attempt to sell stock.

There are few mining districts that have in them opportunities for the development of a mine to the production stage with as small a capital as the Joplin district. In how many camps could a shaft 200 feet deep be sunk at an average cost of $5 to $12 per foot? In how many camps or districts would a shaft equipment of hoist, boilers, cables, engines and housing be secured for the sum of $1,000 to $3,000? In how many instances outside of

the Joplin district could a concentrating plant of 100 to 250 tons capacity be secured and erected for $8,000 to $25,000? Yet this district in the main consists of just such propositions. Of course there are instances where these items amount to huge sums, but in such cases there are either exceptional reasons or gross mismanagement.

### JOPLIN COSTS CONTRASTED WITH OTHER FIELDS.

Contrast, if you please, these costs in other fields. Take shaft-sinking or tunnel-driving in the West, where the country rock is quartz or granite, where here it is shale, limestone and chert, and the depth under 300 feet. The veriest novice can appreciate the advantage of the Joplin operator. The cost of a shaft equipment which must be hauled miles over mountain roads and often in pieces on burros and which must be of such design as to meet conditions where the shaft will be from 400 to 1,000 feet deep, is easily seen to greatly exceed the cost of the equipment needed in the Joplin field. Sometimes the cost of the shaft equipment in other fields exceeds even the cost of the entire Joplin mine and mill equipment. Then there remains the cost of the concentrating plant, which even where it is the very minimum is much greater than the cost of the Joplin mill. Joplin has the reputation of using machinery of smaller cost than any other district of its importance in America.

Zinc mining in Colorado, Utah, Mexico and British Columbia all have to meet some of these difficult problems requiring costly mining machinery and heavy mining costs. Even where the most favorable mining is found there is often difficult separation problems which require costly concentrating machinery.

Contrasted with copper mining, Joplin zinc mining is extremely simple and inexpensive. It is but necessary to point out the difference in the cost of production to realize this. It is safe to say that little copper is produced below a cost of 7 to 10 cents per pound, while the cost of spelter has not exceeded half that amount. Such a contrast is strongly in favor of the zinc producer in the Joplin district, for the greater the cost in production the more capital involved in the units of production. Taking the so-called copper "porphyries," which consist of the low-grade disseminated copper ores, the cost of production mounts very high and the amount of capital necessary to develop such a mine is very large, and the units of production must be large to insure profitable production.

### CAPITAL STOCK IN THOUSANDS, NOT MILLIONS.

Another feature showing the desirability of investing in this field instead of copper mining is the difference in

the capital stock of the operating concerns. The corporations successfully mining copper write their capital stock in millions, while the zinc corporations write theirs in thousands. Only the men of millions can "go it alone" in copper mining, while the field is open to the small investor only in the holding of inconsequential amounts of stocks which gives them practically nothing to say in the management of the property. In zinc mining in the Joplin district the field is open to a larger number of men of smaller means, and they can either directly look after their investment or have a large share in the direction of the corporation which does the mining. This means greater security for the stockholders who invest in Joplin mines. The contrast holds good for lead, silver and gold mining. In those industries the aggregations of capital necessary to successful operation mount far above that needed in the Joplin district and thus take away from the small investor the opportunity for direct control of his investment by minimizing his interests in a property until he is a mere atom among the stockholders. He is still an important factor in the management of the Joplin corporation.

The ease of mining in the Joplin field as compared with other districts and classes of mining means quicker returns on the investment. The time of mine development is short as compared with a copper mine, a lead mine or a gold mine in the West. An investor in a legitimate zinc mining proposition in the Joplin district doesn't have to wait years for a dividend, for the development work can usually be done through competent management within a period of one or two years. The development of a copper mine or lead mine in the West means a period of four to ten years before the dividend period is reached.

### COMPARISON OF SUCCESSES IN MINING FAVORS JOPLIN FIELD.

The number of successful companies in copper mining is placed by Charles R. Keyes at one in five thousand. This is evidently an estimate of the entire copper industry. The number of successful zinc mines in the Joplin district so far exceeds this that the comparison is ridiculous. Just the number of successes as compared with the failures would be difficult to ascertain, as the data has never been compiled, but in this district the consensus of opinion of its own operators is that the successes in legitimate mining far outstrips the number of failures.

It is worthy of thought that in this Joplin field the individual operator or small corporation is still the unit of production. This means a great deal in the stimulation of individual effort. It means that opportunity has not been satisfied, that the field is yet virgin, that it is yet in its very infancy.

Contrast, if you will, the Southeast Missouri lead district with the Joplin field. There the whole field is monopolized by three or four companies, who not only do all the mining but hold the ownership of the vast acreage of land that is mineralized, and thus shuts out the small investor absolutely. Individual effort is stifled completely, for monopoly has complete control. Labor is cheap, and there is found the foreigner who supplants the American, and the district becomes one with decadent social conditions and a district lacking in civic progress. Its towns and cities lack the pride which would make them progressive, and they look poor and mean when compared with the modern cities of the Joplin district. The homes of the mine workers are not often their own but are rented and of inferior quality. As compared with the neat and comfortable homes of the American workmen of the Joplin district, where there is no foreign labor, they are almost like dilapidated shacks.

Investments in the Joplin mining field hold so many advantages over other fields and classes of mining that one who is familiar with it finds it difficult to understand how it has been kept out of the clutches of the great combinations of capital. But be the reason good fortune or luck or something else, the fact remains that it is still the only field where the small investor finds opportunity beside the large one, where monopoly has not found a footing, and where development has only been sufficient to demonstrate its future greatness.

# CHAPTER IX

## CONFIDENCE OF OLD INVESTORS IN ZINC MINING.

Nothing inspires confidence so much as confidence does itself. If the one interested in a proposition is confident, the prospective man to be interested will become confident also. Confidence is in this sense contagious. It is always difficult to present a proposition in which the man who presents it has any doubt. The proposition is likely to inspire only doubt and failure. This natural law applies to all departments of life and is especially applicable in the commercial world. It is for this reason largely that the present prosperity of the Joplin mining district is growing by leaps and bounds. The whole secret lies in the fact that the men already engaged in the zinc mining industry of this district have realized the importance of the field they are in, and the confidence they have in it is so strong that not only are they building up a strong and vital industry themselves but they are inspiring the feeling of confidence in every one with whom they come in contact.

### OLD INVESTORS INVEST HEAVILY.

It means a great deal to the outside world when local capitalists make some of the largest mineral land purchases ever made in the district. Yet without exception all the big land investments that have been made during the past few months have been made by men who have been engaged in mining in this district for a number of years. They were the old investors. They have had experience and should know whether such investments are likely to prove of value. The purchase of the Leonard lands, involving the largest sale for many years, was made by men already largely interested in the field.

The land purchases of the Playter interests during the last few months is another instance of the confidence being felt by the old investors in this field. These interests have been securing a large acreage of ground and are preparing to actively develop it into mineral producers. It is also a significant thing that most of these new investments are made in virgin lands considered to be favorably located with regard to old developed tracts.

The Bendelari and Cook interests have been acquiring large land holdings throughout the mineral field during

the year. Only recently they purchased a tract in the Porto Rico field at a cost said to require the investment of $100,000. Nor is this all; there are many others of the "old guard" who are investing heavily in the district's developed and undeveloped lands and mining properties.

Another significant factor in the present exceptional development of the district lies in the new activities of old operating companies. Take the group of properties under the management of Charles T. Orr. Here is a group that is already actively engaged in widening its field of activity. New leases will be developed, old ground reclaimed and worked, new land acquired, prospected and developed. New mills will be built and old ones rebuilt. In fact there will be expended a large investment in the mining field looking to increased operations and larger profits. This group represents some of the largest and most conservative companies in the entire district. This is but one group, besides which may be named the American interests, as well as many others.

The perfect epidemic of small leases in nearly every camp of the district is an excellent criterion of the feeling felt among the small operators and miners. Throughout the Joplin, Duenweg, Galena and other shallow ground camps the small operator is seizing the opportunity to begin mining again, and all the land holders report that the demand for small leases has been exceptionally great. Old ground has been in great demand, for much of the old ground has shafts already down which may be utilized in many instances, and the very fact that it has once been productive makes it a favorable locality for prospecting work.

But the leases being secured are not confined to the small operators. Some very large interests have been securing leases in various parts of the field. Here, too, is shown the apparent desire of the general public to enter upon new development enterprises. Such a movement means the inauguration of a large amount of prospect work during the winter and spring months, a large part of which is now already in progress.

Such a movement on the part of the men who have been in the field for years has naturally begun to attract outside men to the opportunities to be secured. Within the district at the present time there are a large number of deals which are in progress for the buying of large tracts of land and some for developed leases. In some instances the transactions will run up well into thousands of dollars, while in others the investments are of less amounts. But the aggregate is assuming astonishing proportions. If all of the prospective purchases are made the advent of new capital into the district before the close of the year will surprise even the most optimistic.

What has been especially noteworthy in the rapid growth of the mining activity has been the distribution of the activity over the entire field. No particular camp can be said to have monopolized the activity. The report of new work has come from every camp. The extreme outside camps such as Aurora on the east, Miami on the southwest, Neck City on the north and Granby on the south, have been receiving almost as much attention as the older and more central camps. Galena reports remarkable growth, as also does Webb City and Joplin.

### ACTIVITIES HAVE INCREASED OUTPUT.

All of this activity is rapidly having its effect on increasing the production of the district. While the year started out with a production of practically 5,000 tons per week of zinc ore, the present weekly output has advanced to over 6,000 tons, and the increase will continue. This concrete evidence of the confidence of the district's operators is indicative of the substantial profits now existent in the mining industry.

While it is important for any industry's future growth that investment should be made, it is essential that these investments should be wise ones. The district as a whole during the past year has been expressing general satisfaction at the good judgment displayed in the investments made. As pointed out, these investments have been largely made by men already heavily interested in the industry. Outside capital that enters this field should secure just as good investments as those already made. It is only necessary that in making their investments that they be made with the same degree of care, and the great majority of those already interested here will insist that such care be taken. The district does not desire any haphazard investments, for they are likely to fail and the blame be placed upon the district as a whole, wrongfully. The investor should use conservatism, he should investigate thoroughly, avoid the "curbstoners" and "seatwarmers," employ competent mining engineers who know the district, and when money is thus used the same confidence that at present inspires home capital will become a part of the capital that comes from afar.

# CHAPTER X

## "INVESTIGATE" IS PASSWORD TO SUCCESSFUL INVESTMENT.

The best ship that ever sailed the seas had barnacles that clung to it and impeded its progress. The larger the ship the more barnacles will it attract and the greater the problem of keeping the ship free from them. The zinc mining industry of the Joplin district forms a close analogy to the above statement, owing to the fact that it is one of the most profitable and important in the industrial world, and it has attracted to it and bears the usual burden of barnacles that infest and prey upon all important fields of industrial investment. But while the industry has them it is no worse than other classes of like investments, and it is only necessary to be able to recognize them and prevent their doing the work of destruction which they are constantly striving to bring about. To this end the prospective investor can lend great assistance and not only reap for himself greater profits and freedom from fraud, but render the district valuable service by helping to clean out and destroy these barnacles that infest the industry.

### FRAUDS ARE EXPOSED IN JOPLIN DISTRICT.

While the Joplin district can truthfully boast of its great profits for the investors that have put their capital into the field, it had its "International" and "Consolidated Zinc," both of which the Joplin Globe had the honor to expose and show to the public their fraudulent purposes, thus saving to the district its good name and prospective investors countless thousands of dollars. The very fact that these exposures were made indicates that at heart the industry is sound and these instances of fraudulent promotions but barnacles that hinder and impede the industry's progress.

### NEVER CEASE INVESTIGATING.

The prospective investor, to aid this movement of clearing off the barnacles, must be equipped with the necessary facts to recognize them and at least exercise common sense in dealing with them. In the first place, the investor in this field should not take things for granted,

but should investigate every phase of an investment which is offered him with as much scrutiny as he would give an investment in the very industry in which he is engaged, or with which he is most familiar. This means investigation, and if the investor is a stranger to mining the investigation should be even more searching. In fact, the word "investigate" is the password to successful investment and it must be used from the very entrance to the field, through every turn and throughout the entire life of the investment.

In the first place, it means an understanding of that class of men which this district terms "curbstoners" and "seatwarmers." This field unfortunately has its quota of this vermin. They hang around in the hotel lobbies in wait for the prospective investor. They are proficient in the "gift of gab." They know the district and talk glibly, and are entirely engaging to the unsuspecting, but they end up with wanting to know the intentions of the party. They invariably know of "something good," into which they can by the majesty of their power and influence place the newcomer. If they cannot lead the newcomer into their net they "knock" the other fellow, or pursue the policy of going around to the other fellow and telling him that unless he divides the profits of the deal he will "knock" the property involved. These people and their tactics are so well known in every mining district that it seems strange to the inhabitants of a mining field that the outsider cannot see through the wiles of these men. Yet year after year goes by and despite the warnings of reputable mining men, investors pass by their warnings and go off with such people, who only offer the worthless properties, and when the investor finds out that he has lost his money he blames the entire district instead of the "curbstoner."

### A UNIQUE REMEDY FOR CURBSTONER.

A prominent Joplin mining man recently had occasion to examine a mine in the Ponto basin region of Arizona. He found the typical new mining camp perched up on the side of the gulch. He spent three or four days in the work of looking over the property and finding out all he could about it. Finally one evening just before he left the camp for home, he said to his host: "Well, sir, I have been in this camp four days and during that time not a single man has asked me what my business was, or has 'butted in' on the mining deal which I have come to the camp to close up. I have been surprised, and I do not understand it. Can you tell me where the 'curbstoners' and 'knockers' of this camp have been while I have been here?"

"Yes, sir," the man replied. "Do you see the little crosses planted over yonder on the other side of the gulch?

They mark the last resting place of the fellows who 'butted in' on the last mining deal made here. They 'butted in' on a couple of wise guys, who happened to know how to administer cold lead effectively."

The Joplin man came home and has told the story more than once, expressing the desire that all investors in this district were equally as wise. While the method may be harsh, the remedy for the eradication of such barnacles must of necessity be stringent, and both investor and local mining men should be less lenient than they are.

### LOOSE METHODS ARE VERY HARMFUL.

Loose corporation management and lack of close inspection on the part of investors in the companies in which they invest money is also a fruitful source of fraud. These conditions make it possible for the crooked promoter or mine manager to not only filch from the stockholders' money put up for development purposes, but often to actually defraud them of the mine or lease itself, if the work done reveals that the property is especially desirable. How this may be done is illustrated by the following, which not only shows a crooked manager but how investing stockholders neglect their own interests and then blame the district for their own faults.

### A CONCRETE CASE OF HOW IT HAPPENS.

A mining company started out to develop a mine, and for awhile operated with fair success. A manager was introduced who suavely took part of the company's stock as an investment. He became a director, finally assuming all the prerogatives of managership, and unsuspecting stockholders did not put him under bond or place restraints upon him. The company began to have trouble with their development. The mill was stopped and a cry for more money for development was sent out to stockholders. Some money came in, but still there was no further production. The suave manager gave assurances in plenty. He wrote glowing accounts of what might be expected—if he only had the money for development. Finally stockholders are dumfounded by an announcement that unless work is at once commenced they will forfeit their lease. They hurry to and fro and hasten to see what is the matter. They are met with the announcement that the lease is practically gone unless debts of the company can be wiped out immediately and ample funds provided for development purposes. There are hurried conferences, and then it develops that instead of working the property with the money provided the manager has been merely paying himself his salary regularly out of the funds provided instead of using them as far as they would go in developing the ground.

They next find that the most valuable mining lease they had has been sold to another company or individual for a mere bagatelle by this manager, who suavely again states that he considered it better to sell the lease for a little sum than to lose it by forfeiture, because he had no money to work it. It later develops that the one purchasing it has transferred it to some company in which this suave manager has interests or has finally become its manager.

### THEY INVESTIGATE TOO LATE.

Investigation, too late, proves that there are checks made out to men for work in the mine, indorsed only by the manager for the men. Men unknown to anyone have checks made to them which are not only indorsed by the unknown men but also by this manager. The fact at last dawns upon the investigators that the suave manager has padded his pay roll and stuck the money in his pocket. Every inference that the manager is a criminal is secured from the investigations made, but after all is done the investigating investors wonder if they can really hold the man responsible after giving him so much leeway and employing him without bond. They rail and swear at the conditions found out, but rather than shoulder the responsibility as they should they throw up their hands in disgust and try to throw the blame upon the district as a whole.

### A REAL REMEDY IS EVER AT HAND.

Now what was really needed was for those investors to have so organized their company and so guarded their interests by careful investigation and constant scrutiny of its management that the first culpable act would have been at once detected and the man called to time. He should have been placed under bond or so hedged about with restrictions that he could not have squandered the company's money nor sold its valuable holdings to another company of his own. In other words the investors in this typical case were every bit as much to blame as the manager. In fact their proverbial neglect breeds such contemptible crooked managers.

What this district desires is for every investor to watch his investment and thus help to clean out the industry instead of expecting the industry to render him profits and also act as policeman to guard his money and keep him out of foolish acts.

# CHAPTER XI

## ALL BLIND INVESTMENTS ARE RISKY.

Suppose a rich Western farmer went to New York to invest in Long Island real estate, how nearly does anyone think that he would be able to secure value received for his money? If he had any money left and went to buy a few diamonds, how many first-water gems would it be safe in saying that he would secure through his own selection? Suppose he had never seen an automobile, and started out to buy one, does anyone suppose that his unaided selection would result in securing a machine with a value in proportion to the money expended?

Now, take the supposition in addition to the above that the parties of whom the farmer might seek advice in making his investments were as ignorant as he about them. Suppose that someone might give him advice that was also interested in the articles to be sold. Suppose that some of the real estate men, some of the jewelers with whom the farmer would come in contact, were not dealing exactly "on the square." With these conditions what chance does the farmer stand of telling the good real estate from the poor, of picking out the real gems from the paste, of selecting the reputable dealers from the disreputable ones? He would doubtless lose considerable money, but he would come as near to making a good investment as the men who, absolutely ignorant of mining, go into a mining district and put their money into an investment under exactly parallel circumstances.

The above supposition applies to investment in any field of endeavor and to all classes of men, but it seems to apply with especial force to mining investments. A farmer nor anybody else would scarcely invest in New York real estate without expert advice. No one not a connoisseur buys diamonds without expert advice. But 50 per cent of mining investors put their money into mines and mining stocks without expert advice and expect to secure profitable investments in 90 per cent of their ventures. Such methods can never be satisfactory in any mining field, and the Joplin district is no exception.

### KNOWLEDGE IS REQUIRED.

The valuation of a mining property is a question that requires considerable knowledge. The method of proper valuation is a profession in itself, and the mining engineer and mining expert are indispensable for that reason.

The value of a mine is dependent upon the income which it will provide, just as a piece of real estate or a business block in a city. If the mine will return the principal and a profitable rate of interest on a certain sum within a certain period of time, it is worth at least that principal. Of course, in mining, especially some classes of mining, there is a contingent risk, a risk which involves the chance of depreciation of profits or a tremendous increase in the profits. But the man who invests money in mining property merely on the basis of risk is not making a mining investment—he is making a "mining gamble." He who takes these "risks" with his eyes open needs no word of caution, but the man who really desires to make conservative mining investments should take the necessary precaution to know all about the property that advice from competent authority can give.

To arrive at the value of the profits of a mine involves a knowledge of what are the actual costs of production and whether those costs are excessive or normal. It involves a knowledge of estimating the ore body exposed. It involves the ability of analyzing the conditions of ore deposition, prospecting accomplished and whatever other facts go into the making of the probable extent of the deposit and the life of the mine. When these facts are all ascertained he should be able to intelligently interpret the data and say whether the price demanded for the property is within the limits shown by the mine's percentage of profit.

The above task is not within the possibility of the layman. It is strictly a task for the mining engineer or the man who, though not having that appellation professionally, at least has had the training and experience that has given him the requisite knowledge. In addition there are two other requisites, and they are honor and honesty. Upon this class of men falls the duty of supplying the advice which will guide the investor and protect him from unwise investment.

### ALWAYS CONSULT COMPETENT MINING ENGINEERS.

Any investment of consequence should be made strictly on the advice of a competent mining engineer. His advice will add only a certain amount to the total sum of the investment if it is made, and by his sanction there is added a certain guarantee of safety, and if his advice condemns the investment, the price of his service has saved his client the loss of a much greater sum. In addition, his elucidation of the conditions of the property in which his client invests will provide that client with a certain fund of knowledge which will help him not only in the understanding of his investment, but should guide him in the proper channels for the securing of the maximum benefits from his investment, a thing which otherwise would have

to be learned often at a great sacrifice of both time and money. An honest expert report is worth a great deal more than it costs.

### BEWARE OF GRATUITOUS ADVICE.

Then, in addition to an engineer's advice, there is often opportunity to secure the distinguished advice of reputable mining men in the camp. One should be discriminating in ascertaining where to secure such advice. But a few days' visit with an aptness for investigation will develop the proper sources to secure such counsel. Be sure you will have to look up such advice, for advice worth having is not thrust upon one. On the contrary, the prospective investor will find that the gratuitous advice which will be offered so freely will come from the "curbstoners" and "seatwarmers," the class of men who not only deal in the questionable mines and properties, but "knock" every legitimate proposition. The Joplin district, as every other mining district, unfortunately has a certain number of these undesirables. For this reason it becomes all the more necessary for the outside investor to seek the expert advice of a competent mining engineer and reputable mining mn.

### DISTRICT DESIRES WISE INVESTMENTS.

The substantial mining interests of the district are desirous that the outside investor should not invest his money blindly in this field. They realize through the years of experience that an investor who is unwise or who is misled in his investment is not only a direct loss to the field, but becomes an avowed enemy, and forever injures it. It becomes then not only a desire to see fair play for the outside capital, but it is decidedly self-interest for the district when it desires outside capital to avoid blind investments. Every reputable mining man in the district advises that investment be made carefully, be made on the advice of honorable, honest mining engineers or competent mining men.

While there are many opportunities for profitable investment in the Joplin mining district, no guarantee can be given to the investor who invests blindly. No assurance can be given that an investor in mines or mining lands will secure value for money paid who does not secure the advice of a competent mining engineer or mining man. But when the investor seeks investment with the aid of competent advisers he will not only find a substantial welcome from the district, but he will secure the profits he desires on his investment, and his chances for loss are reduced to the minimum.

# CHAPTER XII

## VALUE OF THE GEOLOGISTS' WORK.

The mining industry of the world stands as a monument to the zeal of the prospector. To him it owes its birth and its early growth. To him it owes its world-wide extent and importance. To him also is entrusted the future growth. With such past accomplishments the world feels that its future for mineral needs will be met by these sturdy men, who have ever climbed the hills and pried out of them the secrets of their mineral stores. Out of the experience of years of prospecting and mining there has been built up a fund of knowledge, which forms the basis for the profession of the mining geologist. He is not strictly a prospector, but he is learned in all the lore of the prospector; he is equipped with every practical thought that has been the outcome of past experience in prospecting. In addition he is equipped with the ability to analyze a given set of conditions and generalize broadly, thus not only giving expert advice on single instances, but giving facts that would help in formulating a working policy on more than a single property.

The Joplin district has been built up largely through the work of the numberless small prospectors, who have searched diligently and have been rewarded handsomely by the finding of some of the greatest mining bonanzas the country has ever known. They have not only made wealth for themselves but they have, through their efforts, developed a great industry upon which many men depend for a livelihood. The work has provided a field for investment which is unsurpassed for the conservative investor. Yet the work of these prospectors did not follow any systematic plan or policy; it has been accomplished solely by individual effort directed along practical lines.

### DATA NOW AVAILABLE TO EVERYONE.

For years the practical prospector has labored in this field unassisted by a generalization of the data which existed in such profusion, but the day finally came when the data was systematized and is at last available for those who will take the trouble to investigate. This latter work was done by the United States and Missouri and Kansas geologists, who have helped materially in placing this great fund of practical prospecting knowledge in a form available to every man who desires it or recognizes its value.

It is free from any commercial prejudices, because done by public servants, and represents work which could only be done advantageously by the public for its own good.

A great many mining men have an idea that the report of a geologist is totally theoretical; that he deals with theories; that he is the very antithesis of practical. Such a conception is farthest from the truth. He is concerned alone with the facts. He hunts up and familiarizes himself with the knowledge of every prospector and miner in the field. He compiles all these facts as a disinterested judge, carefully sorting out the facts from the fancies and hobbies of each miner and prospector. He learns not only the condition that prevails in one mine or in several but in all. He secures not only one set of drill records, but those that cover every condition of ground found in the field.

### WHAT THE GEOLOGIST SHOWS.

He constructs maps showing, as accurately as the data will provide, the mines and mine workings. He shows on those maps the outlines of the proved mineral territory as demonstrated by drill records. He indicates in addition the kind and distribution of the surface rocks. He shows the surface contour. He may indicate the depth of any prevailing stratum of rocks which is shown from mine or drill records. In other words, he places at the disposal of everyone all the known facts about the mining district and one can draw his own conclusions. With any given set of facts everyone does draw certain conclusions if they have logical minds, and the geologist who is trained along his line draws certain conclusions which seem warranted. He may be wrong, but if he is, it is usually due to the fact that the data upon which the conclusion was based was inadequate rather than any mistake in the method of reasoning. That is but the error of all practical deductions, for in any field any increase in the knowledge available may change the methods of development in it. Such work systematizes the entire fund of knowledge and the miner or operator who fails to make use of it fails to properly inform himself and provide safeguards for his company's stockholders.

The future prospecting in the district, therefore, should not only be done along practical lines, but it should have the advantage of the great fund of knowledge gleaned from the prospectors and miners who have been studying this district from its inception. It should make use of the systematized facts relating to the occurrence of ore deposits, and the practical operator and miner will find such information not only of great assistance in his work, but will also have the satisfaction in knowing that he is not going along blindly. He has a check upon his work which

represents the combined experience of every miner and prospector that has ever operated in the field.

### UNIQUE CONDITIONS IN JOPLIN DISTRICT.

Old prospectors and mine operators will tell you that the conditions met in this field are much different from those met in other fields. The mining engineers, who have been called upon to examine properties have found conditions unknown in other fields. The district has its own peculiar traits, and its ore deposits must be found and developed according to methods developed here. For this reason the outside mining engineer who comes into the district to make a mine examination is at sea for some time. He finds it difficult to analyze conditions totally out of his acquaintance, and for that reason the outside engineer often makes mistakes. The local mining engineers, who have had a long experience, are thus best equipped to meet the problems found in this field. The outside investor who comes to Joplin should, therefore, either secure the advice of a local mining engineer, or of one who has had considerable experience in this district.

The future prospecting of the district should bring great growth to the field. The knowledge now available is sufficiently systematized and the methods so well known that the number of failures should be minimized and the chances for success greatly increased. This in itself means an accelerated growth, and with a general application of practical prospecting the outlook for the investor is greatly enlarged. He not only has a larger field, but that field is safer and promises a greater return. He also has the means within his power to safeguard his interests by familiarizing himself with the knowledge which is now available.

# CHAPTER XIII

## VALUE OF THE PRACTICAL IN ZINC MINING.

We learn by doing things in mining as in most everything else. It is for this reason that mining should be approached always from the practical side. One may have all sorts of ideas about mining and the methods which might produce better results, but their application without first knowing the practical side is likely to meet with the worst failures, even though the ideas may have in them great promise. The essence of the matter is that the practical is the foundation upon which all industries are built, and any attempts to court successful mining must take cognizance of these primary principles.

The mining industry of the Joplin district has been built up out of the experience of many men and their accumulated knowledge through a long period of years. The judgment of the best operators has been passed successively upon all innovations, and trials given the suggestions and ideas of the multitude of men who thought they had something to offer as an improvement. The years have thus sifted down the methods offered until the practice has become entirely feasible in all general conditions found throughout the district. The practice, while not perfect and it is recognized that it is far from being so yet, meets conditions as it has never met them before, and for this reason should be the working foundation for everyone attempting mining in this field.

### DUBBED JOPLIN METHODS "CRUDE."

For many years the operators have been subjected to the jeering of men, who came into this field from other mining fields or of men who at once dubbed the mining practice of the Joplin district "crude," whether they had ever done mining or not. They asked why the mining and milling practice was not up to the standard of the copper, gold and silver mining districts, or why it was not carried on in the same way. The answer is simple: merely that zinc mining and milling in the Joplin district was a vastly different problem from the ones mentioned, and the men engaged in its solution had already found that out years ago and were now engaged in working out the industry's problems practically. Where these kickers failed

to appreciate the truth of this answer they often paid dearly for the lesson which they had to learn. It would not be so bad for them to pay for their experience, even dearly, if they accepted the lesson at its true value and took up the work at last in its right way. But the trouble comes in the fact that after they have lost money by their experiments they either pull up stakes and leave the district with words of disapproval or start out along the same lines and lose again.

### HISTORY VINDICATES THE PRACTICAL.

Surely the history of the district's progress is a clear account of how the growth of the district has been along practical lines. The early mining was confined to shallow deposits, the returns from which were within the limits of the price paid for the product. Had the deeper mining then been attempted it would have failed. The early methods of concentration were confined to hand picking and hand jigging. The expensive mill of today would have been entirely impracticable in those days. The amount of losses in the sludge ores of the early concentration were heavy, but the use of concentrating tables were then impracticable and the actual failure of a number of early installations is only a corroboration of the truth of the principle.

Yet the practice has improved. The deeper levels have been opened up, the sheet-ground mines are now running, there are huge milling plants in place of hand-jig plants, there are large sludge mills and machinery installations for the treatment of the fine ores lost in the early operations. All of this has come slowly. It was built up on the basis of the practical application of the new methods. When the method was tried and found justified by results, it became a part of the general fund of information which was given general approval. This represents the foundation upon which to build.

### INVESTOR SHOULD NOT BLAME DISTRICT FOR HIS MISTAKES.

It then becomes almost farcical for the outside investor to come in and rail about the methods employed, when he does not have the experience which the district has had. It places squarely upon him alone the responsibility of the mistakes he may make and the losses he may incur to himself and stockholders. The district cannot be held responsible for the experimental fancies of men who believe they know more about the methods that should be employed than the accumulated experience of all the district's operators. When such failures occur, however, it devolves upon the district to bear with what equanimity it can, the accusation that the fault lies wholly in the district, and recite the actual facts.

These experimental methods are eminently good for the district, where they are employed with the right spirit. For instance, out of these experiments grew the improvements on jigs. The use of the modern jig is now part and parcel of approved methods, resulting in an improved milling practice.

It is, therefore, of great importance that outside investors recognize the value of the practical in coming into this field, for upon such recognition depends largely their chances for profitable operation. The experience of the district should be first absorbed and a solid foundation made before any experiments are undertaken. This system makes for the peace of mind not only of the investors, but of the substantial mining men of the district who are trying to build up a stable industry, and whose efforts are partially invalidated by the lack of co-operation by new investors who ignore the practical.

## ELEVEN YEARS' SHIPMENTS OF ZINC AND LEAD. IN TONS, WITH SEPARATE AND COMBINED VALUES

| | Zinc Ores | Value | Lead Ores | Value | Comb. Value |
|---|---|---|---|---|---|
| 1909 | 301,206 | $ 12,192,770 | 44,186 | $ 2,420,878 | $ 14.615.048 |
| 1908 | 259,598 | 8,917,073 | 39,119 | 2,152,896 | 11.069.969 |
| 1907 | 286,587 | 12,521,522 | 42,034 | 2,898,405 | 15,419,727 |
| 1906 | 278,929 | 12,079,602 | 39,188 | 3,049,573 | 15,128,175 |
| 1905 | 252,435 | 11,334,320 | 31,679 | 1,968,480 | 13,302,800 |
| 1904 | 267,240 | 9,601,200 | 34,362 | 1,886,150 | 11,487,350 |
| 1903 | 234,873 | 7,920,520 | 28,656 | 1.550 870 | 9,471,395 |
| 1902 | 262,545 | 7,973,770 | 31,625 | 1,457,120 | 9,430,890 |
| 1901 | 258,306 | 6,353,950 | 35,177 | 1,617,700 | 7,971,650 |
| 1900 | 248,446 | 6,584,290 | 29,132 | 1,407,810 | 7.992,106 |
| 1899 | 255,088 | 9,590,456 | 23,888 | 1,272,008 | 10,715,305 |
| Totals | 22,905,253 | $105,069,473 | 379,046 | $21,681,890 | $126.604,415 |

# CHAPTER XIV

## COMPETENT MINE MANAGEMENT ESSENTIAL TO SUCCESS.

So much has been said and written on mine management, not only of mining in the Joplin district, but everywhere, that it would appear that the mining public as well as investing public would have familiarized itself with at least the rudiments that go to make up successful management. Yet, in spite of this dissemination of knowledge, there occur annually the failures whose cause lies primarily at the hands of the incompetent manager or the people who placed him in charge of the mine. It makes no difference how rich a mine one may have in this district, or any other, the investors in it have little chance for their money if they insist upon putting in a manager who is ignorant of mining. Even today, with every condition in favor of profitable mining in the Joplin district, there are going to be some failures and these failures in the majority of cases are directly traceable to incompetence and ignorance of mining on the part of the men in charge. Yet when the failure comes these same investors will be likely to lay the blame promiscuously upon the district as a whole, when in reality the fault lies directly at their own doors.

Competency and expert knowledge are just as necessary in mining as in any other industry. That statement is an axiom which seems to be unnoted or unknown to many of the investors in this district. That it is at least disregarded is shown by the fact that we find men buying mining properties and then sending barbers, grocers, real estate men, young untrained sons of the family, relations who are failures in other lines of business, to manage the property and make it a dividend payer! They send anybody from any line of business except a trained mining man and expect the mine to become a bonanza. One might as well try to blow up the Colossus of Rhodes with a fire-cracker as to expect such managers to make any kind of mining pay.

### STORY OF THE DIVIDEND MINE.

Here is the history of the old Dividend mine, which is known as one of the greatest the district has ever had. The eastern investors in this property sent out as their

first manager the former keeper of a woodyard in a little Massachusetts town, with the expectation that he would send back dividends. He didn't do it. Finding a woodman unfitted for the place, the investors next pinned their faith on a tailor, but for once a tailor could not "deliver the goods." He tried for fifteen long months, backed by the money of the faithful back in the East. A mine promoter was next installed, but after expending $3,500 of the stockholders' money, he advised a sale out of the snarl of misfortunes brought about by the multifarious managers. Their patience, as also their money, was fortunately not expended entirely before they learned the lesson that to do mining successfully it should be done under the managment of a competent mining man. When the lesson was finally learned the mine became one of the most famous producers and paid some of the largest dividends on the investment that have ever been paid. Yet these dividends came within a very small margin of being entirely lost through the employment of men who were unfitted for the work because of their ignorance of mining.

This sketch is but representative of many in the field, except that its final success happened to be early enough for the first investors to reap the profits instead of the losses. But the inference to be gained from this is sufficient to indicate what is at the basis of many of the failures in this district as well as other mining fields.

### THERE ARE MANY PROBLEMS TO SOLVE.

There are enough problems in the mining industry to test the knowledge and experience of the best trained and most practical mining men without leaving them to the incompetent and untrained. These problems often prove difficult for our oldest and most experienced. What can one expect from men who never saw a mine when such problems confront them, and they are fully responsible for their solution? Merely failure. Not because they don't honestly try to meet the problems, but because they are not equipped with the knowledge and experience necessary to meet the situation. It is frequently a pitiable sight to see the predicaments into which some of these poor, inexperienced managers and superintendents fall. Some of them realize their incompetence, but after once assuming the management they feel obliged to live up to the confidence reposed in them and they hope to be able to learn the business soon enough to rectify their mistakes; but it takes a number of years to absorb the necessary knowledge and obtain the experience, and few mining companies can stand the drain long enough to let their manager become educated in his work.

Mine management is more than mere bookkeeping. It involves a knowledge of actual operations. Unless the

manager really does know actual mining, he will not receive the respect of his workmen, and he will soon find himself being fooled on every hand. Inefficiency is bred in all departments of the mine until the company's pay roll becomes a "pension benefit" instead of payment for services rendered. This is true of any business where professional knowledge is necessary and is not confined to mining in any district. For this reason it is essential that the manager be a competent mining man.

### MANAGEMENT NOT A BOOKKEEPING JOB.

Bookkeeping systems of accurate cost-keeping are essential parts of mine management, but they alone are inadaquate without the ability to analyze the cost figures, and without the knowledge of whether they come within the limits of ordinary mining practice. The latter is more valuable, for such knowledge would keep the expenditures right whether the books showed it or not. The cost-keeping systems, however, help all concerned in making it possible to demonstrate mathematically the condition of the mine. It is worth money to know that the powder cost per ton is 20 cents instead of 50 cents; that cost of hard iron is 17 cents instead of 35 cents per ton, and so all along the line. But it is worth still more money to know that 18 to 20 cents per ton for powder is good practice in sheet ground. Moreover, it is worth money to have that knowledge at the beginning of operations instead of months afterward. In fact, the failure of the mine may come just because that knowledge was not known by the manager early enough.

Surely the experience of the past thirty years in mining has demonstrated that mine management should be in no other hands than trained mining men, be that training acquired as it may. Experience is a necessary factor for successful management. Mining must be done on conservative business lines, just as any other industry is conducted. It cannot be handled by the ignorant and incompetent, and the failures accruing from these causes are more than from any other source. Such failures should not be laid upon the industry as an industry but placed squarely where it belongs—upon the shoulders of investors who disregard every business law when they place in control of their investment men who are ignorant.

### A POINT FOR THE PROMOTER.

When men who introduce capital into this field insist upon the investment being safe-guarded by the intelligent management of competent mining men, such investments will return better dividends and curtail the losses. It will also be the cause of more capital entering the field. When investors realize that mining in the Joplin district and

elsewhere is an industry where competence and knowledge are as much needed as in manufacturing, they will learn that it is the part of wisdom to see that their investments are placed under a management skilled in mining. They will also learn that by such management their capital will return profits where it hitherto has been lost. Instead of condemning mining in the Joplin district as a hazardous class of investment they will find, as the district's mining men have found, that conservative investments under competent management have rendered splendid profits as few other investment have done.

## HIGHEST AND AVERAGE PRICES PER TON OF ZINC AND LEAD DURING THE PAST ELEVEN YEARS

| | ——ZINC—— | | ——LEAD—— | |
|---|---|---|---|---|
| | High | Average. | High | Average |
| 1909 | $55.00 | $42 20 | $60.00 | $54.78 |
| 1908 | 47.00 | 34.40 | 66.00 | 55.03 |
| 1907 | 53.50 | 43.68 | 88.50 | 68.90 |
| 1906 | 54,00 | 43.30 | 87.00 | 77.78 |
| 1905 | 60.00 | 44.88 | 80.00 | 62.12 |
| 1904 | 53.00 | 35.92 | 62.00 | 54.80 |
| 1903 | 42.00 | 33 72 | 60.50 | 54.12 |
| 1902 | 42.00 | 30.33 | 50.00 | 46.10 |
| 1901 | 34.00 | 24.21 | 47.50 | 45.99 |
| 1900 | 38.50 | 26.50 | 56.50 | 48.82 |
| 1899 | 55.00 | 36.61 | 55.00 | 51.32 |

# CHAPTER XV

## ROYALTIES—A QUESTION TO BE SOLVED.

The question of royalties to be paid in the Joplin district, while one of the most important both to the prospective investor and to the district itself, is one approached with considerable temerity by even the best informed and oldest operators in the mining field. Wrapped up in the question are so many varying shades of pecuniary interest to so many different factors in the industry that it is absolutely necessary in any discussion to observe carefully the interests of all. Unless one deals with absolute fairness, and even when this is done, he is likely to provoke a storm of disapproval both from the beneficiaries of his contentions and from those that produce the evils which he seeks to correct. Perhaps, it is this very intimate relationship of the different interests affected that makes the question one of such vital import, and for that reason so insidious in its evil effects where misapplied.

For instance, the landowner is the first and foremost figure in the royalty question. He is followed closely by the first lessee, who is in turn followed by sub-lessees in an endless chain. Each has certain civil rights accruing either from ownership or contract. Each has certain rights accruing from the place he occupies in the carrying on of the mining industry. It is in the complications arising from the fact that certain rights which are part of the industry are alienated, destroyed or so damaged by the application of civil rights that the natural development of the industry may be hindered. In the protection of the natural rights of the industry there is as much need for fairness as in the protection of the civil rights, and it is only by the protection and safeguarding of these natural rights that the outside investor can be assured of endless opportunity in the Joplin mining district.

### NATURAL AND CIVIL RIGHTS INVOLVED.

To make the question still clearer a concrete instance may be taken. It is a natural right for the landowner to demand a royalty and exact it. It is also a civil right for the landowner to demand that the royalty be as large as he pleases, but the moment he passes beyond a reasonable royalty he invades the natural rights of the

industry and the conflict is precipitated. The whole proposition resolves itself into deciding the maximum point to which royalties may be raised and guarantee an observance of all the natural rights of those concerned.

It does not take an expert to see that if the royalties exacted are too high, the mining industry suffers at the greed of the landowner, or the one who exacts the royalty beyond the reasonable point. The operator of the mine will stagger along under the load just as long as there is any hope of making a profit, but when that hope is gone he will throw up his hands and quit. He thus incurs a heavy loss to himself or stockholders. He will not only shut down so much of the industry, but he will thus antagonize the investors in that mine toward any further investment in that industry. The owner of the land suffers because the stoppage of operations on his land places a ban upon it for future operations. There is general loss to all concerned by the invasion of the economic or natural rights of the mining industry by the exactions of too high a rate of royalty.

## CONCERTED EFFORT IS NEEDED.

Surely the evil effects of too high rates of royalty are patent without further elucidation. What the industry as a whole desires is a general recognition of the evil and a concerted effort by the parties responsible in putting a stop to this block in the way of the district's further development. Enough capital has been lost, enough land condemned, and capital frightened away to stagger the most blatant, swaggering, royalty shark if he will sit down and think the matter over. The same problem if thought over as carefully by the prospective investor would also have saved him his money, and the investors in the district have just as much a part in solution of this question as anyone, and to their utter lack of proper investigation and employment of competent engineering advice may be ascribed a large part of the blame for the development of the question at all.

What is needed in the solution of the problem is but a proper understanding of the principles of rent, royalty and interest, together with an accurate knowledge of the cost of mining. Royalties paid should be large enough to pay a profitable rate of interest on the money invested in the land and the final return of the principal. However, the land should yield to the man paying the royalty a profitable rate of interest on the money he invests in the operation upon it, plus the royalty paid the owner of the land. In other words, the essence of the whole matter is that the landowner and his lessee are partners, in which the landowner has furnished the money to buy the land and the mine operator has furnished the

money to develop the mine and carry on the operations. It is really a matter of equitably dividing the profits which the combined efforts of the landowner and operator have made.

## HOW TO ASCERTAIN EQUITIES.

To ascertain the equity of each in the profits of the concern demands a knowledge of the investment in the land, or the land's value. When that is done, the basis of the landowner's claim is established. It then is necessary to calculate the actual investment of the operator in doing the development work, and when that is done to work out the cost of producing the ore. It is also a matter of concern to calculate the life of the deposit and know the life of the lease. This then forms the material basis for the claims of the mine operator. But in addition to this there are other considerations which must be observed. The risk which the mine operator takes in the development of a mine is a vital part of his investment. That risk is one which in the money world demands a higher rate of interest in return. That risk is not so great a part of the landowner's risk. He has his land for future mining or other purposes, whether this lessee is successful in his venture or not. These facts outline the basis upon which the equitable division of the profits may be made.

Anyone who does not follow such a system in his estimate of whether a lease is a profitable venture or not, works upon a basis of speculation. Unfortunately, while the above facts are in a dim way recognized by almost everyone, they are not always used in the determination of lease values. In a general way only have they ever found expression. It has seemed to be forgotten, and owners and leasers have fallen into the habit of considering the proposition as merely a lease, which may be bargained for at 10, 12½, 15, 20, 25 and 30 per cent, the dickering depending upon speculative values entirely, or the ability of the landowner to make the exactions. Of course, there is a general idea that virgin land should be at a low rate of royalty and developed land at a higher rate; that sheet ground should be lower than the shallow "free" deposits. These are but the most general recognitions of correct values, while the real principles are ignored.

## THE INVESTMENT AND RISK.

Economically, it is not a question of so many per cent royalty for one class of ground or another; it is a question of whether the profits are equitably distributed in accordance with the capital invested and the risk sustained. Let the royalty be paid as so much of the gross earnings,

or so much of the net earnings. It should always be the portion equitably belonging to the landowner. When this principle of estimating the values of leases is put into force by investors generally, losses will be less frequent. It will stop the practice of sub-leases to a great extent, as it will show more completely the margin of profit. The practice of sub-leasing has grown almost into a disease, which needs careful and perhaps more radical treatment. Such methods are solely in the hands of the investor and should be used by him not only for his own protection, but for the good of the industry. When used for awhile judiciously there should be a material reduction in royalties, which should guarantee not only more profitable operation but a greatly extended activity all over the field.

It seems strange that more large land-owning companies have not followed the lead of the more progressive in lowering royalties during 1908. A few of the more progressive in Galena, Joplin and Webb City camps lowered their royalties materially, the movement being brought about by the falling off of operations during the panic months. The return of activities has shown the wisdom of dividing more equitably the profits of mining. Equitable division of mining profits can only mean more prosperity for the industry, as a whole, by guaranteeing equity to the investing capital, and investing capital can render itself and the industry no better service than by insisting upon such division of profits upon the basis of correct principles of investment.

# CHAPTER XVI

## IMPORTANCE OF LEAD MINING IN JOPLIN DISTRICT.

Few realize the importance of the lead mining in the Joplin district because zinc mining has so completely overshadowed it. Yet the lead product alone is of no mean consequence and plays a very large part in the building up of the entire mining industry of the field. Its importance consists not only in the tonnage produced and its value in dollars and cents, but its association with the zinc deposits in many instances provides the additional value which may make the mine a profitable one. In any consideration of the value of an investment in the Joplin district it is very important that the relation of the lead produced to the total zinc produced be thoroughly understood.

At this time the production of lead is equal to about one-sixth of the zinc blende. This is taking into consideration the production of the district as a whole. In some camps there is a radical difference from this average. Some camps produce scarcely any lead at all, while in others the percentage of lead goes very high. The production relations are changed slightly every year by the prices that are paid for the products. If lead prices are abnormally high the production from the strictly lead camps leaps upward and the percentage for the district is affected. The change in zinc ore prices does not so greatly affect the relation of the two outputs owing to the fact that when zinc is mined there is always a certain amount of associated lead which keeps near a normal. It is the strictly lead producing mines that work the changes.

### MORE IMPORTANT THAN CALAMINE.

As compared with the calamine or silicate output, the lead is very much more important. In tonnage it is approximately one and three-fifths times as great. Its relation to the district's total mineral output is thus second in tonnage.

The valuation of the output for 1909 is slightly more than a fifth of the zinc blende value. Taking the blende and calamine values together the relation is almost exactly a fifth. The lead output is valued at practically four times that of the calamine ores. This relation in 1908

was still more in favor of lead owing to the higher relative prices for lead ores throughout that year and the reversal of the prices in 1909. But the showing here made is sufficient to make the comparison of the three ores clear. For 1909 the actual lead tonnage was 44,186 tons, with a value of $2,420,878, which is no inconsiderable sum. This is the largest output in the district's history and shows the growth of lead mining. The fact that this ore usually brings from $10 to $20 more on the ton than does zinc blende ore makes its mining alone a much more profitable proposition than zinc mining as long as the deposit lasts.

The shallow deposits of this ore are the ones which are strictly lead producers. These, when found, are veritable bonanzas for their discoverers. They have been found from the very surface down to 60 feet. Below that depth there is a likelihood of association with zinc blende or calamine ores. As these shallow deposits usually occur in residual clays or greatly weathered chert, the cost of mining is the very minimum of all mining costs in this district. Shaft sinking is very easy and the drifting is never difficult. Since the ground is soft, some timbers must be used, but the shallow depths and short lives of the deposits make heavy timbering unnecessary. Pumping scarcely ever has to be done, the water being beaten with a barrel, or if in the region of deeper mining operations there will be no water at all.

### EXCEPTIONALLY LOW PRODUCTION COST.

Ores taken from such shallow deposits may be actually mined and placed on the market at a cost not to exceed $5 to $15 per ton while the deposit is being worked. Preliminary prospecting is not included in the above cost figures. With such records a matter of common knowledge throughout the district, there is a certain class of miners that follow that line of mining year in and year out. Since lead ores sell from $50 to $80 per ton the profits on such mining are very great and are sufficient to entice anyone into the business. That the business is greatly prized is shown in the way numbers of miners will flock into a camp where such a shallow strike of ore has been made. As many as forty shafts going down at once on a 40-acre tract have been noted immediately after the discovery of such a deposit in the Duenweg camp. The shafts have been known to be still thicker in the old Granby camp in the early days.

Where such deposits are found and are worked out it is not at all uncommon for the miners to sink their shafts deeper and encounter blende ores below, or perhaps at the same level encounter calamine or silicate ores. In either instance such mining is often the forerunner of more

lasting mining and yet offers exceptional profits from the very first. Much of the preliminary prospecting of the district in the "free ore" class of deposits has been done in this way.

There are some mines in the district that have scarcely a trace of lead in them, but the great majority of the sheet ground and disseminated ore bodies have a certain percentage running from one ton of lead concentrate out of every six to nine tons of zinc blende. Since sheet ground mining has become so large a part of the district's activity, these camps have been furnishing a steady and growing production of lead. This fact has in it a very important bearing on the question of profitable operation during the periods of low prices for zinc ores.

### MAY BE THE PROFIT FACTOR.

Take as an example a sheet ground mine where the cost of producing a tone of concentrate is $35 per ton. The mine produces six tons of zinc blende ores to one of lead. Its daily output is equal to six tons of zinc ore and one ton of lead ore. Let the price for zinc blende drop to $35, and so far as the plant's profit is concerned there is none on the zinc output. The lead ore may sell for $50 to $80 per ton, and having cost the same to produce, leaves a net profit of $15 to $45 on the day's output. It was just this margin of extra profit on the lead produced that kept many of the sheet ground mines at work during the recent panic when the price of zinc concentrates dropped below the cost of production. When both ores are selling for practically the same price there is no such advantage, but the normal relation between lead and zinc ore shows a higher price for lead than zinc.

It is for this reason that investors in zinc mining are also interested in lead mining. The two ores are so associated that it is necessary to take into consideration one when considering the other. It is also important to understand that the finding of lead ore in this district is usually only another added advantage which presents itself to investors who desire to enter the zinc mining industry. Alone, lead mining offers inducements which appeal especially to the prospector and small operator and is either alone or in association with zinc a large factor in contributing to the importance and wealth of the Joplin district.

# CHAPTER XVII

## "SILICATE" MINING IS VERY PROFITABLE.

The mining of calamine or "silicate" ore in the Joplin district has never reached the proportions that the number and quality of the ore deposits of the district warranted. The field, while producing an enormous tonnage of ore yearly, has only about 11 to 12 per cent of its output made up of this class of ores. This means for 1909 28,681 tons of silicate, as contrasted with 272,524 tons of blende. This contrast is reversed in the New Jersey, New Mexico and Old Mexico zinc productions. Yet the profits in mining this kind of zinc ore are very large and offer quick returns. For this reason the field is one that should receive not only more attention from the small operator but from the capitalist who desires to secure profitable investment for his money.

### DEMAND FOR CALAMINE ORE IS GROWING.

The demand for silicate ores has become greater during the last few years. The zinc smelter has found that it is very advantageous to utilize the ore in connection with the smelting of the blende ores. A much better recovery is effected in the first place and in the second it diminishes the cost of smelting through the reduction of the amount of ores that have to be roasted previous to putting into the retorts. By judicious mixing of the calamine with the roasted blende the smelting practice is greatly improved. It also obviates the use of other materials in the making up of the charge which would not return any metal, while the calamine will. For these reasons the use of a certain percentage of this class of ores is highly desired and has grown in favor. During the years 1905, 1906, 1907 and 1909 a very large tonnage was consumed which was imported from Mexico. This ore was in no respect any better than that produced in this district, and in many instances not so good, as it only averaged close to 40 per cent in metal, while the Joplin silicates often go above 45 per cent, and the average is more nearly 43 per cent zinc. Besides, much of the Mexican calamine was carbonates of zinc, which ore is less desirable. The ore deposits of the district thus have a distinct advantage in this respect over their Mexican rivals, although handicapped to a certain extent by the cheap labor existing in

Mexico. But this is now offset to a degree by the tariff of 1 per cent per pound on all ores over 25 per cent zinc.

PRICE PAID IS VERY GOOD.

That the demand for this class of ores is insistent is evident by the intense competition for them. The price paid is often higher in proportion than the base price on blende ores. For instance, calamine ores have been known to sell on a base of $30 for 40 per cent zinc when 60 per cent zinc ores were only commanding $50. Or in other words, the calamine ores sold on what was equivalent to the same base as the 60 per cent grades. The very fact that the two ores normally are sold on a different basis shows that there is a differential in the proportionate values of the two ores, and when this differential is passed over the advantage of the calamine ores is more than self-evident. The calamine ores are sold on the basis of 40 per cent zinc and the blende ores on the basis of 60 per cent zinc.

The "silicate" camps in the district are well known for their low mining costs. They are so well known for this reason that they are proverbially called the "poor man's camps." The Granby camp in the southern end of the field holds the premier place as a producer of this ore. It has been the place where the poor men have always made good. It is said, and the saying is not far from being correct, that 90 per cent of the silicate mines in that camp have paid big dividends. The men who have opened them up put in only a small amount of capital. From the royalties paid by these small miners the Granby Mining and Smelting Company has obtained a large part of its acknowledged wealth. What is of still further importance, that camp is but in its infancy as far as its future development is concerned.

Then in the east end of the district is Aurora, which has always held a close second to Granby in the output of its calamine ores. It is no less noted as a place for profitable mining, and the silicate miner, as he is termed, is among the most independent and well-to-do men in that camp. The basis of many of the fortunes made in that camp, as in others in this district, was made by first mining silicate. That camp, too, is far from being fully developed. It has had spasmodic periods of great activity, but the field is still largely virgin.

What has been said of Granby and Aurora may be said of Joplin, Duenweg, Spring City, Spurgeon, Peoria, Sarcoxie and much of the territory contiguous to Shoal creek, in smaller degree. But in every instance the cost of mining such ores is very small as compared with the majority of the blende ore mines. It, therefore, forms a field of development of its own and peculiarly appeals to the small investor.

## DEPOSITS ARE GENERALLY SHALLOW.

Such mining is for the most part shallow. No deep shafts necessitating heavy hoisting expense or heavy sinking charges are found. The shafts that are sunk are scarcely ever difficult ones owing to the open nature of the country rock in which this type of mining is carried on. The ground breaking is inexpensive for the same reason. It is largely a matter of following narrow runs of ore occuring in a soft clay or decomposed limestone or chert. Very little powder is needed for blasting and drilling is mostly confined to mere "spudding." No mining could be done at a smaller cost unless it was done on the surface, and this has been known in the district where it was but necessary to strip the soil and pick out the ore with pick and shovel.

The cleaning and concentration of the ore is extremely simply. Much of it can be done by hand picking. A large part of the ore can be so culled as it is taken out in the mine to give a good marketable product. The remainder may be cleaned in sluice boxes or in hand jigs. In some instances the ore may be concentrated on a milling plant, but in the majority of cases this is not necessary. Surely no mining and concentration could be done at smaller cost. Is it any wonder, then, that miners have been known to sell this ore at from $10 to $20 per ton and make money on the operation? If this could be done, how much greater profit there is with the ore commanding from $26 to $37 per ton?

## ROOM FOR FURTHER DEVELOPMENT.

But there is room for still greater development in every camp. From the work already done in the district the favorable localities are already outlined and much of the preliminary work in prospecting accomplished. The field is open not only to the small independent miner but it needs the introduction of some capital for the more difficult propositions. These propositions offer good returns. Take as an instance the old Beckham mine in the Granby camp. This mine has been worked almost constantly for eight years as a hand-jig and hand-picking proposition. Its rough ore has been sold to a custom plant. It was worked entirely by small operators. Had they put up a concentrating plant or had the mine been in the hands of a man with sufficient capital to put in a concentrating plant from the very start its profits would have been much larger. The present Fortune Teller mine in the Granby camp is an instance where the introduction of sufficient capital to put up a mill has proved to be immensely profitable. Of the many opportunities left in this district none have greater possibilities than silicate mining.

# CHAPTER XVIII

## SHEET GROUND MINING ELIMINATES SPECULATION.

The future production of the district seems destined to come largely from the sheet ground and disseminated ore deposits. Even at the present time the bulk of the ores is coming from that class of mines. Webb City, Carterville, Oronogo, Prosperity, Porto Rico and part of the mines at Duenweg are furnishing ores almost exclusively from this kind of ground. The newer mines west of Joplin belong to the disseminated deposits. With such a showing at present anything said of the future of the district would not be covering the outlook fully if it did not take into consideration sheet ground mining.

The experience of the past few years has demonstrated a number of things in regard to mining this class of ores. Some of those features are more promising than others, but taken as a whole they mean that the bulk of the ores in the future, as now, will come from the sheet ground. During the past two years of hard times it was demonstrated that mines on this type of ground had a narrow margin for operation, and as a result there were more of these mines shut down than any other type. Yet with all this, their tonnage of ore was still heavy. It would seem from this experience that, despite the heavy blow dealt to low per cent ores, they held their own remarkably well even under the most adverse conditions.

### BIGGER SHEET GROUND AREA DEVELOPED.

The amount of land now available for sheet ground mining has been increased very greatly in the Webb City district. Both north and south of that camp the development has been of such importance as to make that camp and its surroundings the premier producer of both zinc and lead. Practically 80 per cent of the ores coming from that camp is produced from sheet ground, and this alone shows the importance which this class of mining has attained. Being the pioneer in the development of sheet ground, it has also claimed the first place in the production columns on that basis. It has also paved the way for the successful operation of this class of mine, and its mining practice has been the basis for the further extension

of this type of mining in other camps. Since the development in Webb City other camps have also taken up this type of mining, or its application to disseminated ore deposits, until the future of the district is largely wrapped up in the exploitation of this kind of mining. The extent to which it may be carried on from the present development represents work for several decades.

Sheet ground mining, or mining of disseminated ores, means that an ore of only 2 to 5 per cent must be handled. It means that the mining cost will be very heavy, due to ground breaking being entirely dependent on machine drilling and heavy blasting. It means usually deeper mining than the "soft ground" deposits and consequent higher hoisting costs as well as initial cost of shaft sinking. It means also the handling of an ore body with a small ore face, running from six to fourteen feet, with an average near ten feet in the sheet ground areas and six to thirty feet in the disseminated deposits. In the disseminated deposits the face is usually much higher than in the sheet ground, with the consequent advantages in ground breaking. But in both classes of deposits the average content of the ore is usually not over 3 to 3½ per cent zinc and lead.

PERMANENCY OF DEPOSITS ONE GREAT FACTOR.

It is evident that the above facts represent difficult conditions unless they are offset by more favorable ones. The one great factor in making such mining attractive lies in the permanency of the deposits and their wide distribution over large areas of ground. For this reason, capital, both local and foreign, has found in this type of mining a closer approximation to manufacturing conditions than to speculative mining. For instance, drilling might reveal that an entire 160-acre tract is underlaid with a seven-foot face of 3 per cent zinc ore. The known uniformity of the conditions makes it practically possible to demonstrate ahead of operations just what kind of a mining proposition is in hand.

With the area, the percentage of ore, the height of face and character of ore known, it then becomes a problem of the size and kind of mill to handle most economically the proposition. The milling cost must be kept within bounds by large units of operation. This means large mills. The small percentage of concentrate in the ore means good milling practice or the proposition is a failure, which necessitates not only large mills, but mills built with all the necessary accessories for the best milling practice.

QUESTION OF MANAGEMENT IS PARAMOUNT.

In such mining, success depends more upon good management and business sagacity than in any other type of

mining. It becomes a matter of adjusting production cost to the point which is low enough to produce a profit when the product is sold. The speculative element in mining in this class of operations in the Joplin district is reduced to the minimum. The profits are not so large in individual instances, but the elimination of the speculative element is a great compensation, and even if the profits are smaller their practical assurance over a term of years makes investment in sheet ground or disseminated mining very attractive to the conservative investor.

The development of the district in the future is apparently going to be more conservative. Experience has taught that the essentials of success lie in conservative methods. For that reason sheet ground mining grew very rapidly when the facts were all made clear in the early experiments. It was found that the initial investigation had to be carried on just as carefully in the development of this class of deposits as any other. It was found that the initial investment was much heavier in doing the development work. The investment in putting up a concentrating plant was also demonstrated to be much greater than the earlier mining demanded. It was also found that mining and milling costs were proportionately higher, but it was also found out that the permanence of the deposit, coupled with good management, meant profitable mining minus the speculative element. In other words, such mining comes very close to paralleling manufacturing industries where the cost of production can be figured, together with the supply at hand, and the investment made entirely on conservative grounds.

INDUCEMENT TO CONSERVATIVE INVESTORS.

When these facts become more generally known, the matter of marketing Joplin mining stocks should not prove such a difficult matter with the conservative investor or even the ultra-conservative investor. What the investor desires is a return on his capital, coupled with reasonable assurance of its return to him unimpaired. Since sheet ground mining done wisely and under competent management eliminates the speculative element in that class of mines, such mining securities not only present safe investments but investments which under normal conditions return good dividends. It would seem therefore that in the future this class of mines should receive a great deal of attention from the outside investor because in them he can see more readily safety and profit for his capital without a long acquaintance with the district, while the older and more experienced in the field will find profit in other classes of mining which still have some element of speculation in them. For the district's welfare, however, it is well that outside investments be made in the more conservative and safer class of securities.

# CHAPTER XIX

## DISCOVERY OF DEEPER ORE LEVEL DOUBLES DISTRICT'S IMPORTANCE.

The recognition of a lower run of ores in the Joplin district due to work in several different camps has meant as much for the district during the last year as the growth of these same camps in lateral extent. Indeed, if the development of these ore bodies proves that there is a wide distribution of this lower run, the future life of the district will be more than doubled and its importance will be greatly enhanced.

The work so far done establishes the presumption that there exist large untouched ore reserves below the level hitherto supposed to be the limit of ore deposition. This means a new life for every tract of ground in the district. It means that prospecting will now include in the possibilities of new productive territory every foot of ground in the confines of the district, whether it has been considered work out or condemned as barren by too shallow prospect drilling. No discovery or movement has meant quite so much to the welfare and future of the Joplin district as this discovery of a deeper level of ore.

### DEEPER ORE LEVEL IS NOW ESTABLISHED.

This deeper level has been recognized by a number of the district's operators for some time, and its development at Cave Springs in the Herald mine and north of Empire in the Ihlseng shaft on the Ping and Robertson lands has had the careful attention of those interested in this new feature. The drilling was accepted as something rather surprising, and only with the sinking of the shafts below the level of the ore deposits was the truth of the discovery established. The first shaft into the ore was the incline of the Herald. This found ore in the regular ore levels of the Grand Falls chert at 180 feet, but passing on encountered the ore below 220 feet in a limestone lying below the Grand Falls chert. The ore is a disseminated variety of good quality. At first this discovery was looked upon as freakish, but being followed by the second shaft showing identical conditions at the Ihlseng property, the drill records of other holes showing ore bodies at that level began to be received as positive evidence of the existence of a lower run of ore which may be more generally distributed when additional drilling has been done to that depth than is at present demonstrated.

The drill holes which indicate the existence of a general distribution of this lower run of disseminated ore are

widely scattered, being found at Springfield on the extreme east to Quapaw on the extreme southwest. The holes are distributed in the camps of the three states of Missouri, Kansas and Oklahoma. The actual developments are only at Cave Springs in Missouri and north of Empire in Kansas.

### C. E. SIEBENTHAL COMMENTS ON DISCOVERY.

The recognition of this lower run of ore has at length been noted by the members of the United States geological survey, and in a recent advance chapter of the Mineral Resources of the United States, C. E. Siebenthal, who has done a great deal of very valuable geological work in the district, in speaking of the developments of the district, says: "The blanket deposits or 'sheet ground' are found in the Grand Falls chert, member of the Boone formation, at depths varying from 125 to 300 feet, depending upon the topography and geologic structure. Below this horizon there are, in the rocks of the Kinderhook age, deposits of disseminated ore. They have been struck in prospect shafts or drill holes near Springfield, Aurora, Granby, Carterville, Joplin, Hornet and Cave Springs in Missouri, at Galena in Kansas, and at Quapaw in Oklahoma."

Taking up the subject of the development in the separate camps, he says of the Herald mine at Cave Springs: "Ore is reported in sheet formation in blue flint (Grand Falls chert member of the Boone formation), between 180 and 220 feet in depth, and between 222 and 290 feet in shaly limestone. The lower run of ore is at the same horizon as that struck in deep drilling north of Galena, and is, in part at least, in rocks of Kinderhook age."

### ADDITIONAL PROOF HAS BEEN FOUND.

Speaking of the deep mining at the Ihlseng mine north of Galena in Kansas, Mr. Siebenthal becomes even more optimistic and says: "What promises to be a very important development of the year was the discovery of deep ore in drilling the Robertson and Ping tracts two miles north of Galena. The ore was found below the Grand Falls chert member of the Boone formation, at what appears to be about the same horizon as that at which the ore body occurs in the Herald mine at Cave Springs. More recently ore is reported to have been struck in the same rocks on the Murphy land at Empire. The fact that these three occurrences are situated in a triangle, each about two miles from the others, offers encouragement to hope that the deposits at this horizon may develop considerable extent. A large shaft is being sunk on the division line of the Ping and Robertson lands, and, if results justify, a double mill will be built, a unit for the ore of each tract."

Since the above was written by Mr. Siebenthal, the

shaft has been completed into the ore, fully verifying the drill records and establishing beyond a doubt the existence of the ore deposit. In addition the shaft on the Murphy land is well started. In addition to the data cited by Mr. Siebenthal on the deep ore levels, there were five drill holes south of Galena near Shoal creek which also showed this same level of ore in the same rocks. This should add still greater evidence of a wide extension of this class of deposits.

### THICKNESS OF DEPOSITS IS ABNORMAL.

One of the features of the ore deposits found at the lower level is the exceptional thickness of the deposit as compared with the deposits in sheet ground. So far, the drill records at Cave Springs and in Kansas, both north and south of Galena, have shown the ore bodies to run almost invariably from near the 220-foot level to the 280 to 300-foot level, giving a minimum thickness of 60 to 80 feet.

The degree of mineralization of the strata during this space varies, but such a large face of ore-bearing ground should help to maintain a low mining cost. In addition the ground-breaking should not be so difficult as in sheet ground, for the limestone in which the ore is disseminated is very soft and shaly and breaks easily. If this continues to be the rule this feature will offset to a certain degree the extra cost of deeper shaft and hoisting and make such mining more attractive.

### DISCOVERY DOUBLES DISTRICT'S EXTENT.

The district has grown greatly in lateral extent during the past year, but this development of the deeper levels of ore promises to double the extent of the district within its old confines. It adds value to every tract of land in the mining field and reduces the hazard of investment by half, for it increases the prospector's opportunity to find ore at still another level.

The discovery and development therefore means as much to future investments as it does to the district itself. While it is of great value to the district in increasing its wealth and importance, it is of still greater importance in the insurance of returns to the investor who enters the field as a developer of mineral lands. It means that if ore is not struck at 20, 30, 40, 50, 100, 200 feet, there is still an additional chance in the next hundred feet, and he who willfully pulls his drill before that hundred feet is tested passes by just as good opportunities in mining as he would if he did not drill at all. Surely the discovery of another deeper level is the greatest development for 1909 in the Joplin district and is only another advantage offered to outside capital for investment.