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M

MACHINES &
GROUP SYSTEM

Kubicek on Fraser & Chalmers

— Mailed
page

To Britain

practically the whole of the trade in boilers, and these are nearly all of the multitubular and water-tube types. We do also nearly all the skips and stamp mills and tool steel, and at least our share of the winding gear. The Germans latterly have been cutting into our trade with trucks of a very cheap class, but it is anticipated that this is only a temporary loss, as the German trucks do not give satisfaction, and the life of a mining truck is of far more importance than its first cost. In rails England shares the market about equally with the Continent. In the larger pumps America is coming to the front, doing probably three-fifths of the total, while we do the balance. We have, however, recently taken over nearly the whole of the market in boiler feed pumps and air pumps.

In compressors, steam and other engines, pipes and belting, England and America divide the market about equally. In wire ropes and machine-tools we still have rather more than half the total.

Germany is cutting into the American machine-tool trade by cheap and inferior, though otherwise very faithful copies of the American tools. She is also encroaching on our market in shoes and dies for the stamp mills, our price being from 23s. to 26s. per 100 lb., and hers 19s. for a fairly good article.

America has quite captured the market in conveyors and oils. In rock-drills she is ahead of us. Belgium does nearly all of the cyanide tanks and accessories.

In electrical plant our position is a very critical

(Ransome, pp. 124-127)

MACHINES - MAIN SUPPLIERS OF ITEMS - LISTED & COUNTRY

1903

(124)

one. I believe we do from 35 per cent. to 40 per cent. of the total, as far as the actual machinery is concerned, if we include the steam-engines for generating the power. In switchboards, lamps and other accessories we are entirely out of the market, owing to the fact that our Continental competitors make an equally good thing for, in some cases, only half the money.

To revert to the question of electrical machinery, i.e. motors and dynamos, we have been steadily losing ground in these to Germany and the United States. And the reason for this is that our older and better known manufacturers have failed to keep pace with the times. Every effort has been made by the local merchants here to continue to do business in their machinery, but their prices are altogether too high, and their machines are said to be no better, and their range much more limited than those turned out by our foreign competitors. Switzerland and Germany have cut us out in electrical accessories; Switzerland, Germany, and the United States are cutting us out in electrical machinery.

With regard to this last item, however, there appears to be one hopeful sign. There is, I am told, a younger generation of manufacturers of electrical plant springing up in England—a new school, if one may use the expression. These firms, who have started with new plant and new ideas, have been able to profit by the object-lessons set by our foreign competitors, which the older firms have not always troubled to follow.

The result is that British-made machines in every way equal to those made elsewhere, and at prices which will enable them to compete in the open market, are beginning to find their way to this country. There are many people here who hope that these firms may save the situation for British electrical plant. It is to be hoped, too, that when our older firms have grasped this fact they will follow suit, and aid in the re-establishing of a trade in a class of machinery which has been steadily slipping out of our hands.

In a place like the Rand, with its enormous requirements in the way of machinery, it only stands to reason that, however much plant it may import, a great deal of work must be done on the spot.

There are several good engineering works in Johannesburg, employing in normal times from fifty to two hundred hands. Just now they are terribly slack. Though, as a rule, their plant is none of the latest, they are equipped for dealing with a great variety of work, even of a very large class. Castings of ten tons can be poured, and heavy forgings are also undertaken. Repairs, of course, form the greater portion of their work, but the local firms at times make various mining accessories, such as skips, and the large built-up winding pulleys.

Of the resident representatives of British firms here, their name is legion. You can walk down street after street in Johannesburg, and, on looking at the window signs, imagine you are reading the

advertisement pages of *The Engineer*. Nearly all the well known manufacturers are to be found who deal in anything that is likely to be of service in the mining industry.

I have strolled in and talked to the managers of many of these firms. They are all very sorry for themselves just now, but I have hardly met one who has not implicit confidence in the future prosperity of the place.

One of the most hopeful signs of the times, as far as British projects are concerned, is the recently formed British Engineers' Alliance, Limited, owned and run by a number of our leading manufacturers, who between them cover nearly all the ground in mining plant. This syndicate is making a great bid for the orders of the British groups of mines above referred to, and for anything else that is going in the way of orders.

Personally, I believe that a judicious grouping of engineering firms, whose interests do not clash in the manner explained above, is the best method for securing trade out here. It is an extremely difficult matter to organize this sort of thing satisfactorily, but when done, it is far more effective than the appointing of the haphazard agent, who may or may not understand your machinery. It is also far less expensive than the establishing by an individual manufacturer of a branch on his own account.

On the whole I should say that British manufacturers are spending at least as much money as should be necessary for securing their share of the

Hammond (+ G. Wilkins) tho' them — USA —
largest supplier of heavy equipment to S.A. 1890s.
mining

Holl, pp. 70-71. (why Hammond) — surely corner
house here.

It is due to the fact, firstly, that some of our competitors, notably the Americans, have succeeded in making certain machines and appliances for gold-mining that are more suitable for local requirements than anything made in England. Of this I shall have more to say in a future chapter. The second reason is that for years past there has been a tendency—at the present day it is stronger than ever—to control these mines in groups by syndicates with large capitals, instead of running them as individual concerns.

When this is the case it only stands to reason that a corresponding tendency towards organizing their methods of purchasing must follow suit. To put it in other words, when a user of machinery finds his requirements sufficiently large, it pays him to become his own merchant. When he becomes larger still, it may possibly pay him to

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(Ransome, pp. 120-121)

Groups - tendency to being own merchant & manufacturer of machines.
1903

become his own manufacturer of machines. It is after this ideal that the various groups of mines have been striving. It is in the direction of this ideal, to which they will never completely attain, that they have bent their steps.

And now, in endeavouring to give a coherent outline of the purchasing methods, I must begin by explaining that the market is practically controlled by seven powerful groups of mines. There are many others, but as they are comparatively unimportant, it is unnecessary for me to complicate my subject by dragging them in.

I class these groups of mines for present purposes as follows:—

- | | | |
|------------------------------------|---|-----------------|
| The Robinson Group | } | British. |
| The Farrar Group | | |
| The Barnato Group | | |
| The Consolidated Gold Fields Group | } | Anglo-American. |
| The Eckstein Group | | |
| The Goerz Group | } | German. |
| The Albu Group | | |

This classification does not necessarily mean that the mines which are bracketed with a particular country are either owned or managed by people of that country, though sometimes it is the case. But it means that, through influence or inclination, the orders they give out have a tendency in a greater or less degree to go to the countries in question.

The three "British" groups buy their machines in the open market, but have a strong British leaning.

Neumann's ?
(p 121)

stance and in fact. They of course purchase as far as possible from the Fatherland, but fortunately Germany is still so far behind the times with much of her mining plant, that many orders for these two groups find their way to England and America in spite of the teachings of the pan-Germanic League.

Of course, where mines have to equip themselves to the best advantage, it is theoretically a mistaken policy for them to bind themselves to purchase through one channel. I do not think, however, that any one of the above groups is tied so tightly to its own particular merchant as to be unable to purchase elsewhere. In fact, it is the usual practice out here for the groups and the firms to repudiate the existence of any sort of a compact between them. But whether a formal agreement exists or no, the result is the same. For good or for evil it tends to tie up the market, or to push orders in a particular direction.

I will endeavour here to afford some sort of an approximate notion of the proportion of the orders for the various classes of machines, which are given out to the competing countries. This, of course, involves a certain amount of jumping at conclusions. I can only say that I have looked before I leaped. I have done my best to ascertain the opinions of others whose business it has been to watch this trade for a longer time and in a more detailed manner than has been possible for me.

On the Rand it would appear that England has

The Consolidated Gold Fields group keep a fairly open mind as between England and the United States, while the Eckstein group is largely interested in a firm of machinery makers and merchants, Messrs. Fraser and Chalmers, and consequently deal almost exclusively with that firm. Messrs. Fraser and Chalmers manufacture their mining plant in England and America—at Erith and Chicago respectively—and so may be classed as Anglo-American. In addition, however, they hold a number of agencies for such machines and accessories in the mining industry as they do not manufacture themselves. Thus they claim to cover the whole of the ground for mining requirements, and to all intents and purposes they do so. And for the requirements of the Eckstein group of mines they practically hold the monopoly.

I am not suggesting that this is a bad or an unjust arrangement, or that it results in the purchase of imperfect plant. I would point out, however, that as most of the machinery agencies held by this firm are American, the firm in question, when we take into consideration its large merchant business as well as its manufacturing, must be classed rather as American than as British.

The two "German" groups of mines on the above list have their own merchant firms from whom they purchase practically everything. The Goerz group buy through the Technical and Commercial Company, and the Albu group through the United Engineering Company. These firms, though blessed with British names, are German in sub-

MACHINES/ON
RAND

10-Yr Growth in Engineering Machinery —

1904

(Gilmour, p. 357)

Commercial Eng

Contractor

worker - but nothing really

residual way

(PTO)

One outstanding feature of the history of these fields is the magnitude to which the industry has grown, both as regards ore mined and gold recovered, in a few years. Speaking broadly, this is a sheer case of multiplication of machines in size and number, rendered possible only by the successful development of the cyanide process, the continuity of the reefs, and the regular value of their contents forming together a sufficient inducement to the investor to subscribe the capital necessary to supply these multiples of plant. Our marvellous rate of growth in the past is apt

But other factors

N/B

Commercial

Engineers -

PTO

The assistance that has been derived from the commercial section of engineers is one of these matters. Certainly they have a material end in view as has everyone else who has to earn a living, but there is no doubt that their constancy in placing before us the latest practice and results of the manufacturers whom they represent, and their persistence in putting forward devices and appliances which it is their business to appreciate, have enabled new systems to be adopted with a feeling of security that would otherwise have had to be engendered by costly experimenting and close study. By their efforts all the latest practice in their departments is submitted in a condensed form under specific guarantees, and many valuable results, of which only a vague description would otherwise percolate to this part of the world, are brought prominently and quickly before our notice. In these days of such voluminous literature and such rapid extension of scientific knowledge, it is impossible for anyone to keep pace with the advance of many subjects, but every commercial engineer is in this light a specialist, who is compelled for business purposes to be fully equipped with an accurate knowledge of what the rest of the world is producing in competition with him. There is thus a fund of information ready to hand and only requiring to undergo a winnowing process in the hands of the user.

The expert knowledge shown by contractors in many classes of work, combined with the facilities at their command in the way of special plant and suitable labour, enable certain undertakings to be carried out rapidly and economically, which, without them, could only be done at a considerable sacrifice of time and unremunerative expenditure. Many of the soundest jobs here to-day have been carried out by contractors, and where the results have been otherwise, the cause has been traceable to the employment of incompetent inspectors, or a lack of judgment in examining the credentials of those to whom the work was entrusted.

While local inventors have done a good deal in improving details, and engineers directly attached to mining companies have, by improvements in the organisation and arrangements of plants, done much to effect economies in labour and material, it must be admitted that practically all improvements of a revolutionary nature have had their origin elsewhere. To adapt the discoveries of others to his needs constitutes by far the greater part of an engineer's work, and the adoption of all that is good in the way of mechanical improvements is practically instinctive. It may seem strange, however, to the casual observer, that such a field as is offered here for inventive talent has not been more successfully explored locally. There must be extraneous causes

Success of visit
 Commercially engineers, contractors
 Capital from agencies, nature of work, complexity of work, or reputation matters
 + capital

gilmour
 P. 356
 NPB

Machinery electric — Durban Roodepoort Deep

1899

(SAMJ 25 Feb. 1899, p. 383)

Boilers — Shaft 1 — 8 boilers — Fraser & Chalmers —
air compressor — steam for mill & surface.

engine Whiting Hoist — first on the Rand ^{at} ~~the~~ de Beers.

main engine room a Reider compressor — 35 inch
mill engine EP. Allis & Co (Milwaukee)

mill 60 1,250 lb Fraser & Chalmers straps.

Durban Rooftop

Mine Machinery - Importance of Rand to California 1895

(Mining + Scientific Press, 2 Nov. 1895, p. 282)
(vol lxxi, no 18]

Machinery, expensive, but - low working costs -

1907

(Browne, p. 334.)

The engineers of the Rand have generally aimed at a high standard in the methods of opening and developing the mines, in the designs of machinery and appliances, and in the percentage of value from the ores. 'No expense has been spared in the effort to establish the industry on an efficient footing in these matters. The general equipment, though unnecessarily expensive, is such as to enable low working costs.

~~Quotable Quote~~ - labour - saving devices - agric. implements
Machinery - not too good
mines to suit conditions evolved - Webb
1893.

labour-saving appliances for mining to suit all conditions are not kept in stock like agricultural implements. To be effective these must be gradually evolved to meet the conditions existing at the mines which are to use them'

(Webb p. 33)

THERE is no type of mechanical engineering which presents such complexities in determination of the best equipment as does that of mining. Not only does the economic side dominate over pure mechanics, but machines must be installed and operated under difficulties which arise from the most exceptional and conflicting conditions, none of which can be entirely satisfied. Compromise between capital outlay, operating efficiency, and conflicting demands is the key-note of the work.

These compromises are brought about by influences which lie outside the questions of mechanics of individual machines, and are mainly as follows:—

1. Continuous change in horizon of operations.
2. Uncertain life of the enterprise.
3. Care and preservation of human life.
4. Unequal adaptability of power transmission mediums.
5. Origin of power.

What they didn't was

(3)

To achieve Economies of scale.

Hoover, Mechanical
Chouder, pp. 124—

Equipment — Compromise —
Capital outlay, operating efficiency
conflicting demands.

1909

p.
124

Mining Machinery - not quite kept up — old ways preferred 1888.
preferred

[Mining & Scientific Press, 8 Sept. 1888, p. 162]

Why mining has not kept up with improvements in other industries, is simply because of all sticklers for old things the miner excels.

"ought to save the precious metals more closely"

[means extraction — often wasteful in U.S.]

Certainly we ought to do so.

Mining Machinery - not quite kept up with rest ¹⁸⁸⁸

(Mining & Scientific Press, 25 Aug. 1888, p. 124).

'Why mining has not quite kept up!'

... "none brought the business such gains as have moved the grain grower through the introduction of the combined reaper thrasher and winnower" — and in manufacturing — that economize labour as do scores of machines...

Ore crushing continues to be preferred for the most part with stamps, greatly improved it is true, yet not essentially different from those in use a hundred years ago

Mining advanced so little as compared with other industries.

started with the new mill. Unfortunately he had been disappointed in the grade of ore which had been running through several levels, but he thought he could safely state that those levels had been almost worked out now, and they could look forward to much better results and anticipate that the promises which he had made four years ago would now be verified. Before he concluded he must place on record the high appreciation the Board felt for the services of their manager, Mr Faulk: the untiring efforts of their secretary, Mr Owen; and the willingness always displayed by the staff and workmen. He wished to place it on record that they had done their work to the satisfaction of the entire Board. Proceeding, he expressed the opinion that they would be able to work still cheaper in the near future, and remarked on the enormous strides the industry had made in this respect, especially since the sittings of the Industrial Commission. Everybody would recognise with him the difference in their working of the mines between 1895 and 1897 and the working of the mines to-day, and the lesson which they had in the last boom would not be easily forgotten by shareholders or by Directors. But there was still a possibility of reducing working expenses, and this would be accomplished gradually, by mechanical means. He did not think that engineering firms throughout the world were aware of the great importance of mechanical means to be employed in stoping and in mining, because, if they were cognisant of this fact, there would be much keener competition in machines used for the purpose. The Rand must open up an enormous field for engineering firms and to engineers, and those who devoted their time and money to finding improved means and the materials required for mining would also find here an ample reward for their labour. He made these remarks purposely, in order that at Home and in America, or wherever engines and machinery are built, they might gradually get to know the importance of this place for trade generally. So far, he regretted to state, they were not sufficiently supplied with the most modern machinery required here—not only from the point of technique, but also from the point of price. The prices which they had to pay for machine drills and air drills, and especially for spare parts, were simply enormous, and added enormously to their cost. Another matter in which they could save a lot of money was in the present indiscreet and lavish—if he might use the word—use of dynamite. There was plenty of room for improvement there. With regard to the use of stores on the mines, he thought they were more lavish than any mining centre in the world, and, were it not that the industry here was so enormously wealthy, he did not think it could stand this expenditure and still show the profits that it did. He pointed out the faults and showed where they were, and only one who had the interest of the industry at heart could have the moral courage to do so. That was his only excuse for pointing out mistakes and faults where they occurred. In conclusion, he said he looked forward to a far more profitable career for the Meyer and Charlton in future, and formally moved the adoption of the report and accounts.

Mr Boucher seconded, and the motion was carried *nem con.*

SECRETARY AND AUDITORS:

Machinery on list. — Cf. the letters - Ann & Br. Albos 1899
 (SAPS), 4 March 1899, p. 407.
 Albos - Charmer's speech
 Esp. stoping mechanised
 RGH. of Meyer Charlton.

Hull → wrong ± Jack Hammer after A/B War —

Hull, p. 120

In the US the Ingersoll Rock Drill Company, which was already doing a brisk business on the Witwatersrand, combined with the Rand Drill Company to form the mighty Ingersoll-Rand. Overnight, it became the leading name in the world for drilling equipment.

Mining technology in the United States was already advancing at a breathtaking speed. Inexpensive but clumsy hand drills were rapidly replaced after the Boer War by Ingersoll-Rand's light jack-hammer, which could cut more easily and quickly into the gold-impregnated hard quartz rock of the Witwatersrand. Not surprisingly, Ingersoll-Rand drills immediately found their way into practically every South African gold mine and were used alongside mining equipment powered by General Electric motors.'

Western (Am. Mining) Conservatism of — the Machinery — 1873
Remoteness — a Difficulty & slowing
down for men. Rock Drilling

Transaction of A. Institute of Mining Engineers, vol. 11, May 1873 - Feb. 1874, p. 144
Spilsbury, p. 144.

This necessity for the introduction of some kind of labor-saving machinery in mining, especially in the West, begins to make itself felt more imperatively every day. No branch of industry has remained so conservative to the old customs and systems of working, as has mining; and yet no branch is so entirely dependent on economical working for a successful issue; and in very few is the proportion of cost of hand-labor to profits obtained so preponderantly heavy.

Perhaps the chief reason for this seeming apathy towards progress in this direction arises from the fact that nearly all mining operations, especially in this country, are carried on in regions more or less remote from the great centres of civilization, thereby rendering the carriage and erection of machinery extremely difficult and expensive. Another reason, however, exists in the fact that a large number of men in charge of mining operations are greatly prejudiced against the introduction of machinery underground, from the idea that it cannot be made to adapt itself to the various positions and work it wd. have to be placed in & perform

Machines - Tube Mills, Stamps, sand filling
dust dust - Cullen ⁽¹⁹³⁴⁾ 1903-14

JCMMS, March 1934, p. 289, 'Fortieth Anniversary, W. Cullen.

No outstanding chemical discovery was made during the period 1903-1914, but on the other hand there were many such in America which had their repercussions in South Africa later on. Our records show that so far as the Gold Mining Industry was concerned, advances in the direction of efficiency were continuous even though no fundamental change was brought about, i.e. fundamental in the sense that the cyanide process marked both an advance and a departure from current practice.

The period in question, however, saw the introduction of tube milling, the use of heavier gravitation stamps, sand filling, modification in the treatment of sands and slimes, the substitution of zinc dust for shavings and innumerable devices for reducing costs of handling crushed and uncrushed ore. It also saw great developments in the cyanide process which in the aggregate improved extraction and cut down the consumption of the cyanide itself. Many papers in connection with explosives were given and it can be stated that the results had important repercussions not only in South Africa, but in other parts of the world.

Machinery is Good (yesterday contradicted) except 1 or 2 specialties 1899

SAMJ, 4 March 1899, p. 409, Geldenhuys Estate - Mr. W. H. Rogers

of our engineers and the class of machinery used on these fields. I think the Chairman of another company who presided at a meeting yesterday somewhat depreciated the excellence of our mining machinery in this part of the world. Although there may be room for improvement in one or two specialties I feel sure that we surpass any other goldfields in the world in the rapid strides made for the betterment of the machinery required for the industry. Your Board very much regret losing the valuable services of Mr Lewis Evans, who has been associated with your

p. 308.

The American impact was easily discernible. As elsewhere, in the wake of the engineer came mining machinery labeled "Made in U.S.A." Charles Rolker ordered American equipment for South Africa in 1894, and Charles Jefferson Clark purchased \$30,000 worth from California in the following year. One of Hammond's subordinates toured the United States, buying electric hoists from General Electric, visiting drum and shaft manufacturers in Akron and the E. P. Allis Company of Milwaukee for electrical transmission equipment, and inspecting the Anaconda works in Montana before his return.¹²³ British experts reacted negatively and often refused to admit any superiority of American machinery, though Edgar Rathbone chastized his fellow Englishmen in 1896, contending that English manufacturers were only then awakening

(Spencer, pp. 308-309)

120. *M&SP*, 65 (August 13, 1892), 197, 71 (October 19, 1895), 255, 72 (February 22, 1896), 152; *EMJ*, 68 (July 1, 1899), 14; Lyons, *Herbert Hoover*, p. 64; Charles Jefferson Clark to John Hays Hammond, Ft. Salisbury, Mashonaland, March 19, 1894, Hammond MSS, Box 1. The role of the American engineer in Africa is touched on briefly, but inadequately, in Clarence Clendenen, Robert Collins, & Peter Duignan, *Americans in Africa, 1865-1900*, pp. 91-96.

121. *M&SP*, 72 (May 23 & June 6, 1896), 426, 463, 73 (October 31, 1896), 361.

122. John Hays Hammond to Richard A. Parker, May 29, 1895, copy, ~~Letterbook 2~~, Hammond MSS.

123. Eben Olcott to Enoch Kenyon, New York, October 18, 1894, copy, Letterbook 22, Olcott MSS (N.Y.); *M&SP*, 71 (October 19, 1895), 255.

P. 309

to the potential of the South African market.¹²⁴ A good deal of British equipment was used, of course, and some was patterned after the American. One engineer wrote back from Johannesburg in 1894 that American compressors and power drills—especially the Ingersoll-Sergeants—were superior, but were being closely duplicated by the English and the Australians. In the mines, such equipment was tested in races for gross production: “It is a contest in which the managers and staffs down to the miner, are all interested and trying to outdo each other.”¹²⁵

Outcrop Mines as powerfully equipped as D.K. ones
eg. King Reelder. Air Compressor

(Hatch & Chalness, p. 145)

Robinson, Crown Deep & Rose Deep.

HOOVER - CHOICE OF MACHINES - HUMAN LIFE 1909

(Hoover, p. 124)

There is no type of engineering which presents such complexities in the determination of the best equipment as does that of mining. Not only does the economic side dominate over pure mechanics, but machines must be installed and operated under difficulties which arise from the most exceptional and conflicting conditions none of which can be entirely satisfied. Compromise between capital outlay, operating efficiency, and conflicting demands is the keynote of the work.

These compromises are brought about by influences, which lie outside the questions of mechanics of individual machines, and are mainly as follows:

1. Continuous change in horizon of operations.
2. Uncertain life of the enterprise.
3. Care and preservation of human life.
4. Unequal adaptability of power transmission mediums.
5. Origin of power.

(Hoover, p. 125)

Third: In the design and selection of mining machines, the safety of human life, the preservation of the health of workmen under conditions of limited space and ventilation, together with reliability and convenience in installing and working large mechanical tools, all dominate mechanical efficiency. For example, compressed-air transmission of power best meets the requirements of drilling, yet the mechanical losses in the generation, the transmission, and the application of compressed air probably total, from first to last, 70 to 85%.

MANAGERS

MINE MANAGEMENT.

582 →

THERE can be no doubt that almost everything in mining depends, in regard to success, upon the competency of the managers. We do not, of course, refer to the directors, but to those officials whose duty it is to plan out and guide the general working of the mines under their charge. The importance of that position is generally acknowledged, and men who have proved themselves capable are in most cases allowed to wield despotic authority over their subordinates. With vast interest confided to their charge, with the success or failure of the mines they superintend in their hands, it is quite proper that they should hold large powers and be able to use them promptly and effectively. In the early days of gold mining upon the Rand, almost anyone who knew "a hawk from a hand-saw" professed perfect com-

SANTS, 13 May 1899 pp. 582 - 583

Mine Managers - Men fellow / take / needs of 1899
C would - uside

miserably. It is very different now when the knowledge technical and general required to fit a man for the position is profound and extensive. We have grown out of the rule of thumb, and are compelled to adopt exact methods in order to obtain success. Our gold ores are not sufficiently rich in the average to allow of tricks being played with their extraction from the bowels of the earth and their subsequent mechanical and chemical treatment. So far as that goes the general manager is bound to have sufficient knowledge of his profession to be able to supervise every department, and it is but right that he should be endowed with somewhat extensive powers in the control of his subordinates. Fully admitting this, it leads to the somewhat delicate question as to how it is that such frequent changes are made in the technical staff whenever a manager takes up a new appointment? It is easy to understand that a general manager who has earned for himself a high reputation for ability and conscientiousness should be a subject for competition by boards of directors who require such services as he may be peculiarly qualified to render. Enhanced salaries and special privileges offered may well induce mine managers to go from one mine to another. It is his own concern, and no one has the right to take objection to it so long as the contract between himself and his employers has been faithfully carried out. In many cases, however, his departure from the mine on which he has been engaged brings on an unsatisfactory state of things there, and not less so on the mine of which he takes charge. The moment a mine manager is understood to be about to make a change a sort of mild panic is set up primarily in the two mines with which he is more particularly associated, but in reality extending far beyond. This uneasiness arises out of the desire of the manager to continue his associations with the staff of the mine he has left when entering upon his new sphere of duty. The result is that as far as possible he attracts those men who have favourably impressed him from the old to the new mine, and in order to do so displacements necessarily take place and a general feeling of incertitude as to what may come next is bound to exist amongst the employes. It may be difficult for a general manager to take charge of a set of men of whom he knows little or nothing, but it is to be assumed that their presence upon the mine is a tacit testimony to their ability to perform their duties, and that they have done so to the satisfaction of their hitherto chief. It is far harder for these men to have to give place at brief notice to men who are held in esteem by the new manager, for they are thrown upon the world by a circumstance over which they have no control, and despite the fact that no fault is found with them for incompetency or dishonesty. Such a state of things can scarcely fail to act prejudicially both to the employers and the employed, unless carried out with great tact and moderation. When men are uncertain of retaining their positions beyond a few months it is scarcely to be expected that they will take sufficient interest in their work to do their best. The employer consequently suffers from inefficient service, for those who do put forth their best endeavours to fulfil their duties are quite as liable to prompt removal as those who are less careful or less ardent in the performance of those duties. There is another point which is not without importance, in which it is possible the interests of the mining companies may be prejudiced by a wholesale change of heads of departments. No two mines upon the Rand, it may be positively affirmed, are exactly alike, either as regards the proper mode of working or the conditions upon which the gold may be won from its matrix. There is a risk that when a new man takes possession of a mine he may find considerable differences in its management compared with what he has been accustomed to deal with. He necessarily

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requires to study those peculiarities, and in many cases it will take some time before he fully masters details and is able to do justice to the mine and himself. Those persons whom he brings to take the place of the old and experienced staff are in precisely the same predicament and have to gain the requisite knowledge at the expense of the new company. It may be freely admitted that from time to time changes may be desirable, but they should be made gradually and with discretion. It is not at all improbable that the idea has been borrowed from the American custom. When a new President of the United States takes up his residence in the White House there is a general shifting of all grades of the Civil Service, and one of the most arduous duties of the new head of the Republic is to satisfy the claims of his supporters for office of some sort. Every four years there is a crisis of this kind, and it can scarcely be claimed that it is a good feature in the American system. It would be very regrettable if such a practice were to be permanently attached to the gold mining industry on the Rand. The demands of scientific mining in this country are almost universal; geology, mineralogy, chemistry and mathematics are required in no small degree to constitute the stock in trade of those who aspire to something more than breaking out ore or loading a skip. It is to the interest of all parties that encouragement should be given to those who diligently study the interests of their employers by giving some assurance that it will be their own fault if they fail to retain their positions. With a prospect of a month's pay or a month's notice to quit on the accession of a new manager, there is certainly but little inducement to the head of a department to do his best for the company which has bought his time and his services, but has no claim upon his enthusiasm. It is, however, to be observed that the strictures we have made are not altogether applicable to the whole of the great controlling houses, which take into careful consideration the merits of their employes and carefully regard their interests. In some of the lesser groups such consideration does not prevail, and it is against such callousness that we protest. The desirability of a mine manager of high repute surrounding himself with those sub-officials whom he knows and trusts is a matter which can scarcely be doubted, if all the circumstances are duly considered when making the changes.

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MASS PRODUC
TION

MASS PRODUCTION — SEE SCALE

Kimberley.

MINER
PROFESSIONAL

Enclosure I.

STATEMENT SHOWING AVERAGE NUMBER OF MEN EMPLOYED ON THE MINES OF THE WITWATERSRAND AREA ON A PERCENTAGE BASIS.

(These figures are based on the figures shown in Annexure B attached to Statistics for the month of February, 1907, issued by the Mines Department, Transvaal.)

| TRADE. | PERCENTAGE OF TOTAL EMPLOYED. |
|---|-------------------------------|
| Mine— | |
| Shift bosses | 1.841 |
| Timbermen | 4.989 |
| Pipemen | .708 |
| Platelayers | .809 |
| Banksmen and onsetters | 3.654 |
| Shovellers and trammers | 5.063 |
| Pumpmen | .897 |
| Mine samplers | 1.389 |
| Machine men, stoping | 9.385 |
| ,, developing | 6.324 |
| Hand men, stoping | 10.275 |
| ,, developing | 1.962 |
| Engine-drivers, underground | .654 |
| ,, surface hauling | 4.039 |
| ,, compressors | .903 |
| Skidmen | .479 |
| Apprentices | .560 |
| Other mine employees not classified | 3.269 |

57.200

FG-11, 1908, p. 404

OCCUPATIONS ON MINE — % AGES — ALL Feb. 1907

Mill—

| | |
|---|-------|
| Foremen | 406 |
| Amalgamators | 1 982 |
| assistants | 1 429 |
| Mill greasers | 243 |
| „ engine-drivers | 1 193 |
| Engine greasers | 202 |
| Vannermen | 135 |
| Apprentices | 209 |
| Tube-mill men | 512 |
| Other mill hands not classified | 175 |

Cyanide Works—

| | |
|--|-------|
| Foremen | 290 |
| Cyaniders | 2 030 |
| Fillers and dischargers | 937 |
| Apprentices | 572 |
| Slimesmen | 418 |
| Other cyanide hands not classified | 290 |

11 023

Workshops—

| | |
|---|-------|
| Foremen | 1 604 |
| Fitters | 6 553 |
| Riggers | 816 |
| Handymen | 606 |
| Boilersmiths | 1 429 |
| Plumbers | 229 |
| Shop enginemmen | 33 |
| Moulders | 135 |
| Painters | 406 |
| Masons | 1 200 |
| Carpenters | 4 113 |
| Smiths | 1 895 |
| Drill sharpeners | 2 724 |
| Electricians | 1 350 |
| Apprentices | 1 807 |
| Other workshop hands not classified | 249 |

25 149

Sundry Surface Men—

| | |
|---|-------|
| Overseers and crusher men | 1 140 |
| Sorters | — |
| Extractors | — |
| Trammers | 310 |
| Diamond drillers | — |
| Weighbridge men | 33 |
| Pump station men | 330 |
| Firemen | 1 584 |
| Police | 850 |
| Mechanical haulage drivers | 149 |
| Locomotive engine-drivers | 250 |
| Unskilled labourers | 465 |
| Other sundry employees not classified | 1 517 |

6 628

100 000

J. H. Johns.

Elsewhere - Training boy at 12 - 18-20 wouldn't put in a hole without elder men of party present. 1907
TG 2, 1908, p. 1226, q. 17, 891. JH Johns.

(In my day, even when he was eighteen or twenty he would not attempt to put a hole in unless the elder men of the party were present.)

Elsewhere - Training - Coal mines -

TG 2, 1908, p. 227, ev. J. B. Roberts. q. 2203.

Long quotation: training

Single-handed & double-
handed bearing.

pump fitting & plate laying is a miner's task. Hadenfeld 1907.

TG 2, 1908, p. 472, q. 5274, w. D. Hadenfeld.

Chinese doing it during strike.

Defⁿ of Practical Miner - J. Hoyle Phillips -

1912.

J. of the CMM. Soc. of S. A. April 1912, p. 410, Discussion, Accidents in Tol. Mines.

J. Hoyle Phillips

What constitutes a practical miner? Is a good machine or a good hand stoper a *practical* miner? We have our underground work specialised so much now-a-days that it is hard to say who is a miner and who is not, much more who is a practical miner. My definition of such a man is "one who can do any practical work demanded from the collar of the shaft to the bottom."

Training elsewhere - Coward - Iron Ore

TG 2, 1908, p. 481, w. J. Coward.

5405. How did you learn?—I had to learn, in the first place, what they call tramming in this country. In the Old Country it is termed "bogeying." The tramming in the Old Country is the same as the Kaffirs and Chinamen do in this country; that is, pushing the cocoa pans. When they see that he is quite efficient and a robust young fellow, they take him out of the bottom levels and put him in the upper workings. When he goes to the upper workings he is generally out on shovelling, and he has to fill the cars up above and tip them into the box for the trammers below. When he has no iron ore to fill, he has to get hold of a pick, the same as his partner, and he has to help to get some more iron ore loose. I want you to understand that mining in the Old Country is altogether different to what it is in this country. It is not solid rock they have to deal with. If you are not careful you would be buried in five minutes, and have the whole concern on top of you. You have to timber there every 18 inches; that is, there are side sticks, what we term in Lancashire "two forks" and a "head tree." When you have got your head tree up, you have to lag it, and when you have got sufficient ahead for another set of timbers, you must put it in. When you strike water in this iron ore, it comes in from all directions, not only from the top, but you must look to the sides and lag, and in many cases it will blow your bottom up by the continual rise of the water coming out of the iron ore. There is none of that here. We have perfectly solid rock, and if you were to take a young man, or the majority of the miners on the Rand to-day, and put them into the majority of the places of mining in the Old Country, they would be absolutely lost. They would not know what to do. Now, I would like to give a case, an instance in rising in the Old Country. We drive there, and perhaps we have 100, 200, or 300 feet to rise up right from the surface. We do it all there with pickwork in loose ground. We may come across some rock or clay or hard substance that we have got to blast. I want you to understand these rises are 7 feet 6 inches or 8 feet by 4 feet 6 inches. We have continually periodical rises. If the ground begins to run on you, you have to keep your timbering close, and all the time it must be kept close until you get it timbered. Now, if you were to ask the big majority of men on the Rand to-day to put up a vertical rise by hand, I feel sure that some of them would not know how to start, and would not know in what direction to go, so I don't want you to think that mining on the Rand is the same as mining in the Old Country.

5407. No; but the point is, the labour is required in this country, and some men must be found to become miners and do mining here?—Yes; that is so.

5408. Is there any objection to young men starting down below in this country, and starting at the bottom, as seems to be the case in other countries?—None at all, but there is a difference between the young man going down to learn a machine as a white helper. I say this, that the white helper going down that mine to work would burst up your contract.

5409. Your objection is to them starting there. You want them to start at the bottom and work up?—Yes; he must start at the bottom if he wants a thorough knowledge of mining, and then go right through to the top. I am sorry to say that the majority of the bosses on the Rand are absolutely ignorant of practical mining.

Expert Miner - all the jobs.

All-round miner

Run a pump, lay pipes, timber a shaft, lay plates.

1907

TG 2, 1908, p. 891, ev. W.T. Andersen q. 992.

MINERS +
AIBWAR

Miners & Anglo - Boer War - Some join regiment - S. A. Light Horse.

Milner's Commission, p. 25, evidence Dr. W. G. Rogers.

MINE MANAGE
RS ASSOC N

Assocⁿ. Mine Managers - 1 of Chief Objectives - Promote Advancement of Mining. 1893

Pres. Opening Address, A.M.M. 1893., J. Harry Johns.

another objective added 1898 ' To promote the interests the Mining Cos
represented by the Members.

A.M.M. 1898, Report of the Council, P. 4.

Opening

Presidential Address, Association of Mine Managers,

Johannesburg, Argus Printing Co, 1893.

(17 July)

Association of Mine Managers - officially opened

17 July 1893.

Presidential Opening Address, A.M.M. 1893, J. Harry Johns.

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