CHROMIUM IN SOUTH AFRICA

By F. P. Bath

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Further contribution to discussion

Dr H. J. R. Way: In his reply to my queries Mr Bath still adheres to his statement that it may be possible to replace the estimated R200 million reduction in gold revenue in 1980 by exports of ferro-chromium, and apparently based his conclusion on a growth rate in demand for corrosion resistant steels of 10 per cent per annum in the next few years.

As I pointed out at the previous discussion at Middelburg this would entail a production of about one million tons of ferro-chromium in 1980.

Exact statistics of South African ferro-chromium production are not available, a fact which is very much to be regretted. But statistics of exports of ferro-chromium are available from "Foreign Trade Statistics" of the Customs and Excise. These show that South Africa exported 99,580 short tons in 1967. The quantity of ferro-chromium consumed in South Africa in 1967 was fairly small and we can therefore assume that the production was 99,580 tons. For this amount to grow to 1,000,000 tons in 1980 would require a growth rate of 19·4 per cent per annum. At 10 per cent this would grow to 344,000 tons and at 7 per cent 240,000 tons.

The following growth rates in the form of average trends are pertinent:

STEEL			Per annum
World steel ingot production	1957–67	:	6·8 per cent
Free-world ingot production	1957–67	:	6·0 per cent
Consumptions of crude steel by four major Free-world consumers	1957–67	:	5·6 per cent
CHROMITE			
World production	1952–67	:	2·5 per cent
South African total sales	1948–67	:	5·4 per cent
South African exports	1948–67	:	3·9 per cent
United States consumption, very irregular, but	1962–67	:	6·5 per cent
FERRO-CHROMIUM			**Per annum**
United States consumption	1952–67	:	6·5 per cent
South African exports	1957–62	:	25·2 per cent
South African exports	1962–66	:	41·9 per cent
South African exports	1966–68	:	21·2 per cent

These figures show that exports of ferro-chromium have been growing at a very high rate varying from 21·2 per cent to 41·9 per cent since 1957, but in view of the market situation it seems somewhat doubtful if that high rate can be maintained up to 1980. Of our 1966 exports U.S.A. took 63 per cent which was 53 per cent of their total imports. Their average consumption is trending at a growth rate of 6·5 per cent per annum from 1952–67, but the growth from 1964–66 was 5·2 per cent and 1966–67, –12 per cent!

I agree with Mr Bath that a reasonable growth to be anticipated in the next decade could be somewhere between 7 per cent and 10 per cent per annum for South African ferro-chromium, in which case the production required in 1980 would be 240,000 tons (7 per cent) or 344,000 tons (10 per cent).

The point he raises regarding our reserves of chromite and their life is an interesting one. One, of course, can glibly say that we have 2,000 million tons, which at the present production of $1\frac{1}{4}$ million tons will last for 1,600 years, but it is by no means as simple as that. One does not realize the great difference that an exponential growth has on such life estimates. For example it may be calculated that if reserves are 2,000 million tons and that the 1967 production will increase at 10 per cent per annum then the reserves will only last for 53 years or A.D. 2,020 and even if these reserves were 20,000 million they would last for only 77 years or A.D. 2,044! If the growth was only 7 per cent per annum then the lives would be 70 years or A.D. 2,037 and 104 years or A.D. 2,071 for the reserves of 2,000 million and 20,000 million tons respectively.

It is therefore very evident that the life of our reserves of chromite depend very much at what rate they will be used up and on what growth that rate will be subjected.

I have given it as my opinion that it is very much to be regretted that exact statistics on the South African production of ferro-chromium are not available. This should be a matter of concern to the Council of our Institute, because the study of such statistics is becoming very important for the determining of future trends in the rapidly expanding mineral and metal industries of our country. It seems that some Department, Association or body should be appointed to collect statistics from the various producers on a confidential basis, summarize and then publish. Steps can always be taken to keep each producer's statistics confidential: it is the total which is of importance to all of us whose object it is to study trends.

Author's reply to Dr H. J. R. Way

Emphasis must be placed on the words "Chromium products" which were used in the paper under discussion rather than Dr Way's specific choice of ferro-chromium.

The regret of Dr Way, that it is not possible to publish detailed statistics to the Institute for obvious reasons, is shared. However, consolation can be found in the fact that all alloy producers render returns to the Authorities who acknowledge the need for control.

The optimism for chromium's ability to close the gap likely to be caused as gold production declines is founded on the belief that endeavours will be made to upgrade the value of chromium units. To a large extent this is being achieved at the present time. For example, a ton of chromium in chromite at the surface of a mine is worth about R10 to the mine owner whereas a ton of chromium in high carbon ferro-chromium alloy is valued at R135 and in low carbon ferro-chromium alloy at R250 at works. A ton of chromium as electrolytic chromium would be worth more than R1,000 per ton. There is sufficient evidence on this score to suggest that Dr Way is using limited data to value the chromium potential in money or tonnage. The figure of "one million tons of ferro-chromium in 1980" could shrink to 300,000 tons of "chromium products", and still achieve the R200,000,000 goal.

It is pleasing to note that Dr Way shares the fears expressed in the paper that chromite reserves should not be treated extravagantly and that every endeavour should be made to practice conservation of this natural heritage.

My thanks are due to Dr Way for his interesting contribution.