

'A little neglect may breed mischief'. 'For want of a nail, the shoe was lost, for want of a shoe the horse was lost, for want of a horse the rider was lost, for the want of a rider the battle was lost. All for the want of a nail'

This issue is devoted to the treatment of the black mineral sands such as those that abound along the east and west coasts of Southern Africa. The papers are from the latest of the conferences that have formed part of a continuing series by the SAIMM over several decades.

It has been a topic of prolonged and detailed technical interest to me, for over half a century. It was in 1955 that I was the leader of a team of engineers and scientists that operated a pilot plant to examine a novel process for the treatment of ilmenite concentrates from South Africa. This was at the Appleby Frodingham steelworks in the north of England. The products were to be iron and metal grade titanium dioxide. The process worked in that a very satisfactory grade of TiO₂ was obtained. But the process was never operated because the source of the ilmenite was from the Umgababa Minerals beach sand plant of Anglo American Corporation in one of the prime seaside holiday resorts along the South Coast of South Africa. Need I say this plant was closed down by the holiday resort owners because of environmental pollution after only a few years' operation.

I have retained this interest over the many decades of the development of the beach sands around Richards Bay using the electric arc furnace to produce iron and a slag as a form of synthetic rutile for pigment production. This was a huge success by virtue of the extensive and high grade beach sands and the low cost of electric power in South Africa. For the same reason, and because of aluminium metal production using imported cell grade alumina, together with the evolution of the biggest coal export harbour in Africa, and the establishment of phosphoric acid production and other industries, Richards Bay became a hub of prosperous economic activity. This was in spite of adverse criticism of the impact of such activities on the existing pristine environment.

It was followed by the Namakwa Sands heavy minerals plant on the west coast, establishing South Africa as a leading producer of the black beach sands and their products.

Richards Bay became the pride of the mining and metallurgical community, not only because of its prosperity and its fulfilment of the promises to ensure that there would be no adverse footprint on the environment, but also for the establishment of schools and other infrastructure to provide income to the local population of 50 000 inhabitants.

To use the analogy aptly described in the Presidential address by Joshua Ngoma (see the September 2009 issue of this Journal), the technical personnel represented a bank of pathfinders to lead the way forward to economic development in the region.

The way forward was to provide the skills so vital for employment opportunities needed for poverty alleviation in the rural areas such as those of northern KwaZulu-Natal. Progress in the '90s and at the turn of the century was such that many believed that indeed a pattern was emerging in sustainable cluster evolution that could catalyze the success formula countrywide. There were many of us who realized the great potential of this region for job creation, not only in the mineral activities but also in agriculture, tourism, housing, energy, and infrastructure, and

Black sands, black swans, and teachers

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particularly for establishing training facilities.

But as cautioned by the President, the Black Swans were lurking. Inevitably in every nation's future plans, there are fundamental steps that are pivotal to success. My quotation from Benjamin Franklin is to point out that these are often naïvely considered of secondary importance. But they could torpedo the voyage unless resolved with expediency and thoroughness. Top of the list of disastrous scenarios, is our abysmal national attitude to the teaching profession. Herein lurk the Black Swans. The analogy with Franklin's words is pretty exact. Teachers lay the foundations of learning. Learning is the foundation to skills and knowledge. These both lead to wealth and service to society. These create the Nation. It is the teachers who impart obedience, discipline, learning ability and a work ethic to the youth taking the nation forward.

Unless the teaching profession enjoys respect, direction and support from pupils, society and business, we are lost.

Salaries are at the pauper level and represent wishful thinking in attracting the quality of entrants we need or even retaining the good ones we have. Information and all other technology advances are imposing revolutionary new demands from teachers. They must have at least the same opportunities and incentives to upgrade and acquire the latest innovations as other professional members of society. This means an interaction with those in industrial and other economic activities and developments. Undoubtedly there are many other problems in the education system, but I am sure we will never get it right without the input of motivated, dedicated and up-to-date teachers.

I am sure that with Richards Bay as a focal point, there is a wealth of opportunities to fulfil these ambitions to create an exciting model of an educational cluster. I visualize an internationally recognized centre of excellence for teaching, training, developing and demonstrating job creating activities for Africa and other underdeveloped countries. To describe the scope of such a crusade is way beyond the space available. But if enough interest is forthcoming, I am sure the Institute will consider an indaba, or whatever conference name is chosen for something uniquely African. Let me add that the Namakwa Sand beach sands operation on the West Coast is also in an area where there is scope for industry/government collaboration in poverty alleviation.

I must refer to the other black swan that threatens future potential of the black sands in Southern Africa. This is the dramatic shortages and increase in the cost of electric power which brought about the closure of the aluminium plants at Richards Bay two years ago. Electric power is the lifeblood of the electrometallurgical industries and is receiving priority attention at top level.

However, this could be a challenge by way of cogeneration of power and use of alternative energy sources. Could this be 'grist to the mills' of the cluster industries of Richards Bay by using waste coal (with possible by-products of alumina and sulphuric acid) and biomass?

Another topic for a future Journal Comment or Indaba?