after preliminary testing and evaluation of the different types of steels in the laboratory, the more-promising materials were prepared in relatively small rectangular sections and incorporated into a section of a shaker conveyor carrying gold-bearing quartzitic rock. Under wet-abrasion conditions in the shaking conveyor, both the laboratory and underground tests showed the stainless steels to be much superior to proprietary abrasion-resistant alloys, the ferritic stainless-steel grades proving superior on the basis of cost related to percentage of volume lost.

Contaminants in Bearings

Mr P. R. Diener, of Timken South Africa (Pty) Ltd, presented a paper, 'Lubricant Contaminants and Their Effects on Bearing Performance', which had been presented previously at a meeting of the Society of Automotive Engineers in Peoria, U.S.A. Although the theme was rather removed from that of the other papers, this contained some interesting information about how contaminants—some of them very deleterious in their effects—found their way into bearings, particularly of the tapered roller type. Solid particles finding their way into the bearing produce 'bruising' as a result of plastic deformation of the contact surfaces. This may easily be followed by spalling of the surface and rapid failure of the bearing.

Water entering the lubricant is by far the most common form of contamination found in bearings. Seals or breathers on the bearing may allow water to enter, but water may also be formed by condensation when there is a large gradient in the temperature in the bearing housing between operating periods and stationary periods. A chemical reaction between the water and the lubricant may liberate sulphur from the lubricant by hydrolysis, and this sulphur subsequently attacks the bearing surfaces.

Water-etching of the surface is the second form of chemical attack, and consists essentially of corrosion of the bearing surfaces. This may advance to produce random areas of pitting, followed by quite severe spalling. It has been shown that a reduction of up to 40 per cent in the fatigue life of bearing steels may be caused by small concentrations of water in a lubricant. Fine submicrometre cracks generated in an early stage, into which water vapour condenses, act as fine capillaries, aggravating corrosion and leading to hydrogen enbrittlement.

The paper also presented some very interesting case histories of different causes of failures in bearings.

High-temperature Furnaces

In the closing paper of the colloquium, Mr Peter Johnson, of J. A. Leys Engineering, discussed 'The Choice of Materials for Use in High-temperature Furnaces—the Effects of Hostile Environment'. Emphasizing that his talk was confined to furnaces operating below 1250°C, Mr Johnson pointed out that, until very recently, the furnace industry in this country had relied very heavily on overseas expertise and design. This position has changed remarkably, and, when furnaces that are to operate in this temperature region are designed and built in this country, the furnace designers arrange for very extensive sub-contracting of the various components and ancillaries of the furnaces. One of the difficult problems is the judicious selection of locally available materials of construction, particularly of the exotic heat-resistant types. Mr Johnson stated that the final choice of materials lies with the furnace engineers and is frequently a compromise. The purchaser must be made aware of the nature of such compromises and their implications for the future performance and life of the furnace.

Obituary: W. S. Findlay

William Schreiner Findlay (1908 to 1980) had a distinguished career in the mining industry, to which a mere account of his appointments does not do full justice. However, they give some idea of his ability as an engineer and a manager.

He joined Randfontein Estates Gold Mining Company Limited as a Learner Sampler in October 1934, and by 1942 was Manager of the North Vertical Shaft. In June 1944, he was apointed Manager of Consolidated Murchison Ltd and, in February 1946, was transferred to Johannesburg Consolidated Investment Company Ltd. He was appointed Manager of Freddies North and Freddies South Lease Areas in July 1947, and returned to J.C.I. as an Assistant Consulting Engineer in October 1949. He became Consulting Engineer in January 1951, Manager in Johannesburg in October 1957, and Director and Deputy General Manager in September 1959. Owing to ill health, he retired from the Company in December 1962.

Mr Findlay was a long-standing member of the South African Institute of Mining and Metallurgy, and served as its President in 1960–1961.

The Institute extends its sympathy to his son and daughter, and their families.