

Obituary: Professor J. de V. Lambrechts

The South African Institute of Mining and Metallurgy mourns the passing of one of its most distinguished sons. Professor J. de V. Lambrechts died at Franschoek on 30th January, 1988, at the age of 76 years after a long illness.



He was President of the Institute in 1962/63 and was accorded Honorary Life Fellowship in 1975 in recognition of his devoted and dedicated service. Having joined the Institute in 1936, his membership extended over a period of 52 years. During that time he served on Council from 1955 to 1974, and was Honorary Editor of the *Journal* for three years after having served a two-year apprenticeship as Assistant Editor. In 1940, he was awarded the Institute's Gold Medal for his paper entitled 'A critical review of dust sampling methods employed in Witwatersrand gold mines', which was based on the thesis for his Master's degree. On two other occasions he was awarded the Institute's certificate of merit for technical papers published in the *Journal*.

Early Years

Jacobus de Villiers Lambrechts was born at Villiersdorp in the Cape Province on 28th August, 1911. He attended the Franschoek High School, where he matriculated at the age of 16. After enrolling at the University of the Witwatersrand, he graduated in 1931 with the degree of B.Sc. (Eng.) in mining and metallurgy. This was but the beginning of a meritorious academic career. In 1940 the degree of M.Sc. (Eng.) was conferred on him by his *Alma Mater*. In 1959 he became the first candidate to be awarded the degree D.Sc. (Eng.) in mining engineering, for a collection of his various papers compiled into a volume entitled 'Studies in Atmospheric Environment and Control in Mines'. During his distinguished career, Professor Lambrechts did much valuable original research work in the field of mine ventilation and dust control,

and became a leading authority on those subjects. The impressive list of publications that flowed from his pen attests to his knowledge of the subjects and his personal contribution to the industry's assault on these important problem areas.

After graduating, Professor Lambrechts joined Crown Mines (1932), where he received his basic mining training. It was probably at Crown Mines, which was a hot, deep mine, that he first encountered the problems of heat and injurious airborne dust to which he devoted his research in later years. The three years that he spent at Crown Mines must have been very difficult as these were the depression years, marked by severe drought conditions and much hardship and suffering in the country. Then followed four distinct phases of his professional career.

First Phase

The first phase, which started in 1936 when he joined the Mines Department as an Assistant Inspector in the Heidelberg District, lasted for 10 years. During that time he gained valuable practical experience in the mining of all types of minerals such as those containing gold, coal, diamonds, copper, iron, asbestos, manganese, and chromium. His transfer from Heidelberg to Johannesburg allowed him to conduct research into dust and heat problems. In 1940, that work, written up in a thesis, led to his gaining the M.Sc. (Eng.) degree at the University of the Witwatersrand.

He also obtained the Mine Managers' Certificate of Competency (metalliferous and coal) and the Mine Surveyors' Certificate of Competency. In 1944 he was seconded to the Government of Northern Rhodesia for three months. His brief was to investigate and report on the dust and ventilation conditions in the underground mines of the Northern Rhodesian Copper Belt.

Second Phase

The second phase of his professional career started in 1947, when he joined the Anglo American Corporation as Group Ventilation Engineer. He was the right man to deal with the planning and control of ventilation arrangements at Anglo American's new gold mines in the Orange Free State and western Transvaal, and at the Bancroft Copper Mine in Northern Rhodesia. During that period, he was awarded the D.Sc. (Eng.) degree by the University of the Witwatersrand. He served for 25 years on the Council of the Mine Ventilation Society of South Africa, and was its President in 1954.

Third Phase

The third phase began in 1964, when Professor Lambrechts was asked to establish the Department of Mining Engineering in the young Faculty of Engineering at the University of Pretoria. His wide practical experience, academic background, and Afrikaans origin made him an ideal choice for the commission. During his 10-year tenure of the Headship, the Department was firmly established and, despite many difficulties, continued to develop to maturity.

Fourth Phase

The fourth phase of Professor Lambrechts' career was

his retirement years, after he had left the University of Pretoria as Emeritus Professor at the end of 1974 at the age of 63. He returned to his much-loved Franschhoek, where he maintained his technical interest in mining while becoming active in civic affairs, serving as Mayor of

Franschhoek in 1980. Professor Lambrechts will long be remembered for his wonderful personality, patience, and academic prowess. His contribution to the mining industry in addressing the problems of heat and dust was immense.

Mintek Application Reports

A new series of Mintek reports made its appearance in 1987. These are Application Reports, which present an overall perspective of each of Mintek's technical thrusts to ensure that the existing expertise can continue to be readily accessed. Without these reports it would not always be readily apparent just which projects, reports, and scientific papers contributed to a specific technical thrust; nor would the extent of the technology transfer or its economic implications always be clear. Technology transfer is very important to Mintek, which pursues a carefully controlled policy of goal-oriented research with a strong commitment to the transfer of its research-and-development findings to the local mineral and metal industries so that these industries and the country as a whole can obtain the maximum financial benefit.

These reports are available from Mintek free of charge. However, there is a handling charge of US\$25 for reports that have to be mailed overseas.

● The successful development of an industrial process for the recovery of platinum-group metals from the UG-2 Reef. *Application Report* no. 1. 1987. 16 pp.

This Application Report provides an overview of a substantial suite of Mintek research projects that extended over eleven years. This suite of projects supported the technical thrust for the exploitation of the UG-2 Reef and culminated in a full-scale commercial operation at Western Platinum Mines Ltd.

This report outlines the early work on the UG-2 Reef conducted by the Analytical Science and Mineralogy Divisions of Mintek, and summarizes the process-development work, from bench-scale via pilot-plant to commercial-scale operations, executed predominantly by the Ore-dressing and Pyrometallurgy Divisions.

The increased PGM reserves resulting from a viable process for the UG-2 Reef are estimated, together with a listing of the many advantages to be derived by existing mines from the processing of the UG-2 Reef. The total cumulative cost of the project suite is given.

● The development and implementation of a computer control strategy for conventional milling circuits. *Application Report* no. 2, 1987. 15 pp.

This report briefly indicates the magnitude of the milling operations on South African mines and explains the need for a system of control for milling circuits.

The Mintek research-and-development programme, covering the work done in the field of multivariable control strategies, is reviewed from its inception at Mintek's Chemical Engineering Research Group at the University of Natal to the first successful implementation of a multi-

variable control system for the No. 1 milling circuit at the East Driefontein Gold Mine of Gold Fields of South Africa Limited.

The progress of the transfer of the technology to other gold-ore milling circuits and to a milling circuit treating ore from the Merensky Reef is outlined.

The cost of this technological thrust by Mintek is presented, and the financial benefits that can accrue as a result of the application of the multivariable control strategy to the gold-mining industry are appraised.

● The development of an integrated carbon-in-pulp process for South African conditions. *Application Report* no. 3. 1987. 17 pp.

This report describes a major research-and-development programme undertaken by Mintek in collaboration with the South African gold-mining industry on the development of an improved process for the recovery of gold from local ores and tailings. This development, the carbon-in-pulp process (CIP), was proved to be applicable to both large- and small-scale plants.

After a brief outline of the history of the use of carbon for the recovery of gold, the report reviews the whole programme of work, including the following major aspects:

- (a) fundamental studies of the chemistry involved in
 - (i) the adsorption of gold onto carbon,
 - (ii) the elution of gold from loaded carbon, and
 - (iii) the electrowinning of gold from eluate;
- (b) an examination of the nature and structure of activated carbon;
- (c) improved procedures for the screening of large volumes of feed materials at fine sizes;
- (d) the development of novel interstage screening devices to retain coarse granules of carbon and allow fine pulp to flow through;
- (e) the development of a novel electrowinning cell;
- (f) investigations into the response of carbon to thermal reactivation;
- (g) the development of devices capable of measuring the important variables in the control of the CIP process; and
- (h) the scale-up of the process in nine years from laboratory scale, via several stages of pilot-plant work, to the largest full-scale operation of 50 kt of flotation-plant tailings per day.

The manner in which the technology was transferred is described, and the results of the research programme are highlighted together with an estimate of the financial benefits.