Jack Holmes / METALLURGY

For his massive contribution to the large-scale commercialisation of solvent extraction of copper, in Zambia and worldwide, Jack Anthony Holmes, formerly Technical Director of Anglo American Corp (AAC), for induction.

In 1970, Jack, after a year of private study and calculation, persuaded the understandably apprehensive Board of Anglo American Central Africa Ltd to abandon convention and rather invest upwards of $150 million in some innovative technology to recover 100,000 t/y of residual acid-soluble copper from current and accumulated flotation tailings at Nchanga Mine: that technology was solvent extraction (coupled with electro-winning). This bold proposal was made at a time when SX of copper was in its mere infancy, having been installed in only Arizona at very small scale, in specifically Ranchers Bluebird (5,000 t/y copper) and Bagdad (7,000 t/y copper). The recommended venture represented considerable (albeit much-investigated, by JAH himself) technical and financial risk to Nchanga mine; and it was a major vote of confidence in Jack’s capabilities, for a positive decision to have been taken by the Board, at that time. The Zambian project accordingly went ahead and the plant was commissioned in 1973. The operation’s early and obvious success generated universal confidence in the technology and heralded the subsequent world-wide acceptance of SX-EW as a reliable and preferred technology for recovery of leached copper (and later zinc and cobalt). Although a succession of other plants of substantial size soon emulated the Nchanga project, the latter remained the biggest in the world for a decade or more.

Recovery of the material from the tailings dams was done by hydraulic monitoring, as used at English China Clays but only slightly in the metals mining industry e.g. Umgababa Minerals, Natal, where Jack was involved in 1962. Leached tailings were dewatered in the biggest horizontal-belt-filter installation in the world; and indeed, the filters were developed and modified, especially for the project.

It was an inspired decision of Jack’s, before final plant design, to seek permission from Bagdad Copper Company, to ‘borrow’ sections of its 7,000 t/y commercial plant, for his metallurgists to use as a pilot plant, in which newer technologies and optimising techniques could be researched and developed. One piece of Anglo knowledge that was disclosed gratuitously to Bagdad and allowed to become public, was the use of dissolved cobalt (in electrolyte) to stabilize lead anodes when operating at increased levels of acidity and current density. This modus operandi is now standard practice, throughout the industry.

Additionally, Jack was involved in and very supportive of the setting up - (by jointly ICI Ltd, UK, and Pinkney and Atmore of AAC, Johannesburg) - of ACORGA Ltd, UK, a company that soon introduced the enormously successful alternative range of modified aldoxime SX reagents for copper. Jack’s higher education began at Kings College, London, from which establishment he emerged in 1953 with graduate qualifications in both chemistry.
and chemical engineering. He was eventually to be professionally qualified as FIMM, FIChemE and FSAIMM.

He started his illustrious industrial career at the Harwell division of the United Kingdom Atomic Energy Authority, where he stayed for over 3 years before joining Anglo American’s mining operations in Northern Rhodesia. His first assignment was in R&D where, working for Denis Kelsall, he helped develop and patent the cyclowash system for improving classification efficiency of hydro-cyclones. They also developed a new flow-sheet for the Nchanga concentrator operations.

Jack moved rapidly through the Anglo-Rhokana-Nchanga divisions, working in various concentrators, including presiding over the building of a new satellite mill and the re-structuring of the concentrator, both at Nchanga. He assisted at the cobalt plant and managed both the electro- and fire-refineries, at Rhokana and he went also to Johannesburg, becoming involved in projects and operations in vanadium, monazite, and other minerals. He became Metallurgical Manager at Nchanga in 1968: and it was from this position that his bold solvent extraction recommendation was made. Jack then progressed to become Consulting Metallurgist for the entire Zambian operations of the Anglo Group.

JAH eventually transferred to the Anglo American Head Office in Johannesburg, as Deputy Technical Director to the then biggest miner of minerals in the world. In this role he enhanced metallurgical disciplines and project participation throughout AAC’s operations, globally. He remained, though, an unflinching advocate for continuing investment in the Central African copper mining industry, which is now once again a thriving business — further evidence of Jack’s tenacity and vision.

In 1978 he was appointed Technical and Executive Director of AAC, assuming managerial responsibility for also the engineering, mining and geological service departments; and he had technical oversight of AAC operations worldwide, including projects and exploration.

He stepped down voluntarily in 1992 but was retained for a further eight years, working in the Chairman’s Office, with a range of managerial responsibilities, including negotiation of the re-privatisation of the Zambian Copper Mines, developing and controlling a high-tech Venture-Capital Company in Israel, and directing a long-running AIDS research project based in America. Jack, in his career, had been a Director of no less than 11 mining companies.

To combat AIDS, Virginia van der Vliet reported in Optima, Healthy Profits, April 2011, pp06-10; “Anglo American assembled a heavyweight in-house ‘brains trust’ to examine ways of tackling HIV/AIDS, which was rapidly becoming a pandemic. The incipient team included Technical Services Director Jack Holmes, Chairman’s Fund Director Michael O’Dowd, Industrial Relations Consultant Bobby Godsell, Scenario-Planning Expert Clem Sunter, and medical consultants Drs John Laing, Ian Potgieter and Charles Thomas.”

There are but few metallurgical technologies in the mining world that have not been influenced by Jack Holmes: and many figureheads in the industry owe gratitude to him for their successful careers.