Capturing the Technical Heritage of Experts

Author: Rodney Jones
Presenter: Adrian Deneys
Socrates

- Socrates lived from 469 – 399 BC
- The Socratic method of teaching involved asking questions
- The great philosopher, Socrates, did not record his own words
- Plato recorded the teachings of Socrates
Socrates and Plato

PLATO
THE REPUBLIC
unabridged

The Last Days of
Socrates

Socrates
Plato
Socratic Method

- The Socratic method led to the development of the scientific method
Library of Alexandria

• From ~280 BC to a few hundred years later
Library of Alexandria

- The Library of Alexandria was the centre of collected knowledge in the ancient world
- Scholars such as Euclid and Archimedes are said to have written, studied, and experimented there

Euclid

Archimedes
Between the birth of the world and 2003, there were five exabytes of information created. We [now] create five exabytes every two days.

- Google CEO Eric Schmidt, 2010
Danie Krige's publications

A selection of Danie Krige's publications over half a century

CD compilation for APCOM 2003
David Robertson Smelting Symposium

'Celebrating the Mega-scale'

In conjunction with the TMS 2014 Annual Meeting

San Diego, California, USA, 16-20 February 2014

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Publications by David Robertson


Mintek’s Pyrometallurgy Division

Technical Papers

2013

- Presentation: Electric Smelting in Southern Africa (Plenary address at EMC 2013) (2864 kB)
  Audio (28 MB)
  RT Jones

- Reductive smelting for the recovery of nickel in a DC arc furnace (45 kB)
  RT Jones

- Aspects of DC chromite smelting at Mintek - an overview (Plenary address at Infacon XIII) (10545 kB)
  IJ Geldenhuys

- Computational modelling of submerged-arc furnace burden behaviour (7339 kB)
  QG Reynolds and K Bisaka

- Presentation: Water atomization of iron-nickel alloys (1195 kB)
  RT Jones

- Ni-Co 2013 (Book available from Wiley)
  Edited by T Battle, M Moats, V Cocalia, H Oosterhof, S Alam, A Allanore, RT Jones, N Stubina, C Anderson, and S Wang

2012

- Open access to metallurgical publications (489 kB)
  As published in SAIMM Journal (583 kB)
  RT Jones

- Factors influencing the residence time distribution in continuously-fed batch-tapped furnaces (267 kB)
  RT Jones and QG Reynolds
Scientific publishing of journal papers has been in existence for about 350 years

The world’s oldest and longest-running scientific journal, the Philosophical Transactions of the Royal Society, was first published in March 1665, in London

Henry Oldenburg – Secretary of the Royal Society and first Editor of the publication – ensured that it was ‘licensed by the council of the society, being first reviewed by some of the members of the same’, thus making it the first ever peer-reviewed journal
The Royal Society announced in October 2011 that they had made the historical archives of the Philosophical Transactions (over 60 000 scientific papers) permanently free to online access from anywhere in the world.

All of the historical archival papers (published more than 70 years ago) from the Philosophical Transactions are now freely available on their website.

Current publications are available via delayed open access where older articles (12 months for biological sciences, and 24 months for physical sciences) are made freely available.

They also allow a hybrid open access or open choice option where authors can pay an article-processing charge that allows for their article to be made freely available immediately upon publication.
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<td>M Lotz</td>
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Conference Papers

- Analytical Challenges in Metallurgy (2006)
- Apcm 72 (1972)
- Apcm 87 Mining (1987)
- Apcm 87 Metallurgy (1987)
- Apcm 87 Geostatistics (1987)
- Apcm 2063
- Base Metals 2005 - Kitwe
- Base Metals 2007 - Swakopmund
- Base Metals 2000 - Kasane
- Base Metals 2011 - Phalaborwa
- Coal Preparation (2000)
- Composite Materials (1990)
INFACON: International Ferro-Alloys Congress

- Infacon XIV, Kiev, Ukraine, ~June 2015
- Infacon XIII, Almaty, Kazakhstan, 9-12 June 2013
- Infacon XII, Helsinki, Finland, 6-9 June 2010
- Infacon XI, New Delhi, India, 18-21 February 2007
- Infacon X, Cape Town, South Africa, 1-4 February 2004
- Infacon IX, Quebec City, Canada, 3-6 June 2001
- Infacon VIII, Beijing, China, 7-10 June 1998
- Infacon VII, Trondheim, Norway, 11-14 June 1995
- Infacon VI, Cape Town, South Africa, 8-11 March 1992
- Infacon V, New Orleans, USA, 23-26 March 1989
- Infacon IV, Rio de Janeiro, Brazil, 31 August - 3 September 1986
- Infacon III, Tokyo, Japan, 8-11 May 1983
- Infacon II, Lausanne, Switzerland, 12-16 October 1980
- Infacon I, Johannesburg, South Africa, 22-26 April 1974
CHROMIUM FUNDAMENTALS
Session Chairpersons: R.H. Eric & E. Ringdalen
Aspects of SAF Smelting of Ferrochrome (Keynote)
P.C. Hayes
Analysis of Transport Phenomena in Submerged Arc Furnace for Ferrochrome Production
Y. Yang, Y. Xiao, and M.A. Reuter
Solid State Reduction of Chromite with CO
Y. Xiao, C. Schuffeneger, M. Reuter, L. Holappa, and T. Seppala
Reduction Behaviour of the Akaavaara Chromites of Northern Finland
R. Hiltunen and J. Harkki

ENVIRONMENT
Session Chairpersons: W. Bryszewski & A.K. Stott
Reduction of Chromium Oxide in Stainless Steel Slags (Keynote)
N. Sano
Oxyfines™ Technology for the Re-Melting of Fines, Dust and Sludge
J. von Scheele
Direct Smelting of Stainless Steel Plant Dust
T.J. Goff and G.M. Denton
Alternative Routes to Stainless Steel - A Life Cycle Approach
T.E. Norgate, S. Jahanshahi and W.J. Rankin
Ken Mills - Slag modelling
Misty Hills, South Africa, 7 March 2011

The Estimation of Slag Properties (Course notes)
K.C. Mills

Slag properties spreadsheet (Excel file) and instructions (Word file)
K.C. Mills

Pyrometallurgy 2011 Conference Papers

Copyright © 2011, Ken Mills and Rodney Jones, rtjones@global.co.za Randburg, South Africa (Last updated on 6 October 2011)
Ken Mills video

The estimation of slag properties

Ken Mills

Department of Materials, Imperial College, London,

Slags

- Very important to metal production
- Performs the following functions
  - Seals off metal from O - prevents oxidation
  - Removes nasty elements (eg. S, P) from metal
  - Removes non-metallic inclusions (eg. flotation etc)
  - Reduces heat losses from metal surface and prevents “skull formation”
  - Continuous casting of steel – provides lubrication and heat transfer control
- “Look after the slag and the metal will look after itself”
Ken Mills video – Continuous casting
Ken Mills video – Slag humour

$B_2O_3$.
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Dick K.P. Yue, Professor, MIT School of Engineering

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Conclusions

• Knowledge is expanding rapidly, but there is a skills shortage; therefore the knowledge of experts should be captured
• Encourage open self-archiving of publications
• Companies should maintain online collections of staff papers
• Technical societies should make journals and conference proceedings available via open access
• Record short courses, presentations, and lectures
Mintek’s DC furnaces

http://www.mintek.co.za/Pyromet/