

Chemical Engineering Seminars – TT 2009

*Week 6, Wednesday June 3rd 2009, 4:00PM-5:00PM
Lecture Room 2, Thom Building, Engineering Science*

A respiratory aid and prosthetic lung

Professor Bill Johns,
Managing Director, Haemair Ltd

Abstract

120,000 people die of lung disease every year in the UK.

We describe a device that promises to reduce lung disease deaths by direct blood/air mass exchange. The presentation covers:

- 1) A brief introduction to the respiratory system
- 2) Relevant blood chemistry
- 3) A brief introduction to relevant mass transfer theory
- 4) The natural regulation of respiration
- 5) Simulation of the respiratory dynamic response with and without respiratory aid
- 6) Placement of respiratory aid
- 7) Development priorities immediate and long-term

We acknowledge the support of the Chemical Engineering Group and Medical School at Swansea University, of the ABM University NHS Trust, and of the Welsh Assembly Government.

Biography

Bill Johns is currently the managing director of Haemair Ltd and of Chemcept Ltd (chemical engineering software and consultancy). After completing BSc and PhD in Chemical Engineering at Imperial College, Bill has held a range of positions including Technical Group Manager - ICI Ltd, Reader in Process Systems Engineering - Swiss Federal Institute of Technology, Sub-Dean Mathematics and Computing - Westminster University, Professor & Head of Department of Chemical Engineering - South Bank University, Chief Chemical Engineer - QuantiSci Ltd (international environmental consultants). After completing a PhD covering combined convective and radiant heat transfer and high-intensity combustion, Bill has worked in many areas including the instability and disintegration of liquid sheets, the production and properties of polydisperse sprays, optimizing on-line computer control of processes and instruments, general-purpose simulation systems for chemical processes including improved methods of representing physical properties and process synthesis. Bill has developed "Best available technique" guidance for processes involving Uranium, assessed safety of systems including stand-by equipment, and collaborated in developing international standards for interfacing chemical engineering software.