TUKKIES PROFESSOR ELECTED AS VICE-PRESIDENT OF THE INTERNATIONAL WATER ASSOCIATION

Prof T Eugene Cloete was recently elected as Vice-president of the International Water Association (IWA), at an IWA board meeting held in Japan, during the Third World Water Forum in OSAKA and Kyoto.

Prof Cloete is at present Chairperson of IWA-SA and has been a member of the IWA Governing board for the past two years and was elected to the IWA Strategic Council during 2002 and previously served on the management and policy council for a number of years. He is also currently the Chairman of the IWA Specialist group on Bio-fouling and Bio-corrosion. Cloete has wide-ranging experience in water supply and sanitation as well as industrial and wastewater treatment and has published extensively in these fields with more than 90 publications in science citation indexed journals. He also holds 7 patents and has published two books. He is currently the Editor in Chief of a book on health-related water microbiology and was recently appointed as an Associate Editor of *Water Research*, which is the leading international journal in terms of its citation index rating in the field of water research.

CONTRIBUTION

His contribution to water issues lies in the practical implementation of his research, including the development of a solar water pasteurisation system for producing potable water in rural areas, a better understanding of biological phosphorus removal from activated sludge and the optimisation of the chemical control of bio-fouling and bio-corrosion. He is the Chairperson of the School for Biological Sciences at the University of Pretoria and also the Head of the Department for Microbiology and Plant Pathology at the same university.

IWA

IWA is the largest global network of water professionals, spanning the continuum between research and practice and covering all facets of water. One of its aims is the advancement of education in particular by the exchange of information and experience, and promotion of research into the scientific, biological, engineering, legal and administrative aspects of water pollution abatement and control and in the publication of the results of this research for the benefit of the public.

Through IWA, more than 6 000 members collaborate to lead the development of effective and sustainable approaches to water management, with emphasis on the science and management of drinking water, wastewater, storm-water and the conservation of water resources throughout the world. IWA seeks to create value and drive the advancement of both the science and best practice of water management in cooperation with other similar international efforts in the fields of water resources, and irrigation and drainage.

SPECIALIST GROUPS

The ultimate strength and potential of IWA lies in the professional and geographic diversity of its membership represented by 52 Specialist Groups consisting of a "mosaic" of member communities including academic researchers and research centres, utilities, consultants, regulators, industrial water users and water equipment manufacturers in more than 120 countries. IWA members from each of these stakeholders represent the leading edge in their fields of specialty, and together are building new frontiers in global water management through interdisciplinary exchange and collaboration. It joins the network of initiatives of the past decade, of the Stockholm Water Symposia, the World Water Forum, the Global Water Partnership, UNEP, UNESCO and the World Health Organisation. IWA and its members are committed to furthering sustainable and holistic resource management and service provision, built on the concept of the complete water cycle.

SARS AND THE DANGER OF WATERBORNE TRANSMISSION

Recent laboratory reports indicate that the SARS (Severe Acute Respiratory Syndrome) virus has been detected in the faeces of patients. This is unusual for pathogens associated with respiratory infections and raises the question whether SARS could be spread through waterborne transmission?

According to Professor Willie Grabow, Head of the Department of Medical Virology at the University of Pretoria, the chances are slim, theoretically, that water may play a role in the transmission of SARS for the following reasons:

All viruses are designed to enter the human body by a particular route to infect specific host cells. For instance:

- Respiratory viruses are designed for transmission primarily by the inhalation of airborne viruses which enables the viruses to infect their specific host cells in the respiratory tract. This includes the viruses which cause influenza, the common cold, and also SARS.
- Enteric viruses are designed for transmission by ingestion which enables them to infect cells of the gastrointestinal tract. This includes the viruses which typically cause gastroenteritis, viral hepatitis and poliomyelitis.
- Bloodborne viruses need to be inoculated directly into the bloodstream to reach their host cells in various organs of the body. This includes the viruses which cause Crim-Congo fever (inoculated into the bloodstream by the bite of a mosquito), rabies (inoculated into the bloodstream by the bite of a dog) and AIDS (inoculated into the bloodstream by sexual intercourse).

Consequently rabies, Crim-Congo fever and AIDS are not contracted by drinking sewage polluted water, and influenza is not contracted by the bite of a dog or a mosquito, etc.

CORONA VIRUS

Presently available information indicates that SARS is caused by a mutant of a corona virus, not known before the first clinical cases of SARS were diagnosed towards the end of February 2003.

This association of SARS with a corona virus may cause confusion, Professor Grabow says. Corona viruses are typical respiratory viruses and one of the most important causes of common colds and related respiratory infections all over the world. Corona viruses do, therefore, occur in abundance in most parts of the world.

It would appear that SARS is caused by one of these viruses that has undergone mutations resulting in a new highly virulent virus. Viruses undergo mutations all the time. Typical examples are other respiratory viruses such as the influenza viruses, which have new strains in circulation every year.

Confusion may be related to the fact that there are certain corona viruses which inhabit the gastrointestinal tract of many people without causing clinical disease. These enteric corona viruses are not associated with respiratory infections. This is confirmed by epidemiological data and genetic analysis of the viruses. Consequently there is no reason to believe that the respiratory corona virus associated with SARS is related to the enteric corona viruses, Professor Grabow says.

WHO

On 8-9 May 2003 the World Health Organisation (WHO) held an emergency meeting of international experts in Madrid, Spain, to investigate the possibility of the SARS virus being transmitted by water. This is part of international endeavours to control the spread of the virus by every possible route of transmission. The latest findings of research on the virus, and epidemiological data on the transmission of SARS, were analysed. The meeting concluded that so far there is no evidence that water or food may play a meaningful role in the spread of the virus. However, 321 cases of SARS at the Amoy Gardens complex of 33-floor apartment blocks in the suburb Kowloon Bay of Hong Kong, suggested that water may possibly have played a role in the infection of this large number of individuals. A seemingly significant number of cases lived in apartments close to a wastewater pipeline from top floors to the bottom. The theory is that cracks in the pipeline may have caused contamination of U-traps in bathroom floors, and that droplets containing the virus may have been spread when bathroom fans were in use. However, it would appear most likely that the viruses was spread by conventional respiratory transmission among these people who lived closely together. In other words, infections were contracted by the inhalation of airborne viruses excreted by infected individuals when sneezing or coughing.

The meeting concluded that the SARS virus has a number of rather unusual characteristics and more detailed research was required for more reliable assessment of the risk of waterborne transmission of the virus. The unusual features include detection of the virus in both faeces and urine of patients for up to 21 days after onset of disease, which is most unusual for respiratory viruses. However, detection was by molecular techniques and the extent to which these viruses are infectious remains to be established. There is no meaningful information on the survival of the virus in sewage or polluted water environments. Another interesting feature of the SARS virus is that it seems to be highly host specific. In other words, contrary to well known other respiratory viruses such as influenza, it infects only humans and no animals or insects. This is rather fortunate since it seems to rule out animal reservoirs and insect vectors.

In view of the many questions about the SARS virus which remain unanswered, the WHO Working Group has embarked on the formulation of a research programme for more detailed assessment of the potential role of water and food in the transmission of this deadly virus that has far-reaching public health and socio-economic implications.

"Obviously, if there is any indication of a meaningful risk for waterborne transmission of the SARS or related viruses, the findings will immediately be applied in the formulation of control strategies," Professor Grabow says.