

Medical Advisory Committee that participated in negotiations to establish a medical school in Johannesburg. In 1923, he was appointed as the first lecturer in tropical medicine at the University of the Witwatersrand and, in 1931, he was awarded a Doctor of Laws (LLD) degree (*honoris causa*) by the same university.

Other honours awarded to him include gold medals from the Mine Medical Officers' Association, the South African Medical Association for distinguished services in the field of medicine (1926), and the Institution of Mining and Metallurgy (1958), London, the last being the highest honour to be bestowed on men who had served the mining industry. In 1970, he received the Alumni Achievement Award from the Alumni Association of the Jefferson Medical College. He was an honorary fellow of the Royal Society of Tropical Medicine and Hygiene, and of the Royal Society of Medicine.

Orenstein was also presented with numerous civilian awards, including the Panama Canal Service Medal, the Belgian *Croix de Chevalier de l'Orde de la Coutonne* in 1925 (Order of the Crown of Belgium) for his work in the Belgium Congo, and the gilt emblem to the Voluntary Medical Service Medal from the Red Cross Society.

In 1956, Orenstein was appointed as the first director of the Pneumoconiosis Research Unit (PRU) established by the Council for Scientific and Industrial Research, in Johannesburg, but continued to consult to Rand Mines. He served as general secretary to the Pneumoconiosis Conference in Johannesburg in February 1959, and as editor of its proceedings (1960).

Orenstein wrote a book on *Mosquito Control in Panama; The Eradication of Yellow Fever in Cuba and Panama* (New York, 1916) and published around 100 papers in local and international journals, on topics such as malaria prevention, the etiology of scurvy, hookworm disease, public health, and the health of miners.

Orenstein lived in a house in Saxonwold, Johannesburg, now known as the Villa d'Este, now a National Heritage site. He enjoyed music, reading, and the theatre, and was one of the founder members of the Johannesburg Repertory Players and the Alexander Theatre. He also enjoyed motoring and flying, and was one of the founders of the Light Plane Club.

An inaugural lecture, held in 1962 at the inception of the Museum of the History of Medicine, was delivered by Major General Orenstein under the auspices of the Museum and the Medical Graduates' Association. After he died in 1972, at the age of 92, the name was changed to the AJ Orenstein Memorial Lecture at the suggestion of the Chamber of Mines of South Africa to perpetuate his memory and to commemorate the part he played in the establishment of the medical services in the mining industry.

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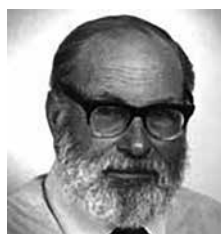
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# John Christopher Wagner

## (11 April 1923, Pretoria – 25 May 2000, Dorset)

**Prof. Emeritus Cedric Bremner** - Department of Surgery, Faculty of Health Sciences, University of the Witwatersrand  
**Rochelle Keene** - Independent Curator

John Christopher Wagner was a pathologist who researched the health effects of exposure to asbestos fibres. He was one of the most outstanding authorities on asbestos-related diseases, both from a pathological point of view and in relation to his expertise on the experimental approach to asbestos toxicology. His work provided milestones in research work on asbestos toxicity. His results were of paramount importance in the regulation of asbestos use, providing a better understanding of asbestos-related diseases. In addition to his work on asbestos, he and his co-workers studied a similar type of fibre, called erionite, in collaboration with Prof. I Baris, a Turkish clinician, who had discovered a high mortality rate due to mesotheliomas in some areas in Turkey. The findings of fibrogenicity and carcinogenicity of erionite in rats provided an important demonstration of the ability of other types of fibres



**John Christopher Wagner**

to produce lung and pleural damage. He became internationally known for his work on occupational lung diseases.

John Christopher Wagner was born in Pretoria in 1923. His father, Percy Wagner, was an eminent economic geologist, and the Director of the South African Geological Survey. He described many mineral deposits in Africa, including asbestos, diamonds, gold and platinum. The family, originally German, had emigrated from London in 1810. He was six years-old when his father died. He was educated at Michaelhouse in present-day KwaZulu-Natal and went to the University of Natal in 1941. In 1942 he joined the South African Field Artillery, taking part in the north African and Italian campaigns.

After the war, he returned to Johannesburg to study for a MBCh degree at the University of the Witwatersrand Medical

School, graduating in 1951. He then trained in pathology at the South African Institute for Medical Research (SAIMR) and, in 1954, was appointed Asbestos Research Fellow at the Pneumoconiosis Research Unit (PRU) in Johannesburg. He enjoyed original observation, being involved in the identification of a new type of organism similar to a tubercle bacillus. This organism was found in inflammatory lesions affecting the Cape hyrax (the dassie). His work on asbestos-related lung diseases began at this time. South Africa is unique in having asbestos deposits of all the main commercial types – chrysotile (white), crocidolite (blue) and amosite (brown), each situated in a different area. The PRU studied disease in asbestos miners of the different fibre types.

In 1956, while working at the PRU, he conducted an autopsy on a black miner thought to have died from tuberculosis. He later wrote: "On opening the thoracic cavity, I was amazed to find a huge gelatinous tumour." The tumour was a mesothelioma, and further examination of the lung revealed clumps of asbestos bodies. It was a finding that influenced the rest of his life, the work of his fellow researchers, and the understanding of the toxic health effects of asbestos.

After he diagnosed this first mesothelioma case, he conferred with colleagues and discovered that a group of similar cases had occurred at a tuberculosis hospital in Kimberley. He hypothesised that asbestos could be involved, and soon made the link with exposure to blue asbestos (crocidolite). This required some detective work, as many of the patients had never worked with asbestos but lived near the asbestos fields; others had left the areas while they were still children.

In 1959, Dr Wagner presented a seminal paper at the International Pneumoconiosis Conference held in Johannesburg. This included his observations on mesotheliomas occurring in association with asbestos exposure. The paper was published in 1960<sup>1</sup> and has become the most cited occupational medicine paper of all time. In this paper, he established, for the first time, a relationship between pleural mesothelioma and crocidolite asbestos exposure. It was also in this paper that mesothelioma was finally accepted as a pathological entity separate from tuberculosis. Malignant mesothelioma of the pleura of the lung usually occurs decades after exposure to asbestos fibres.

These findings led to him being awarded a doctorate from the University of the Witwatersrand in 1962. They also initiated an explosion of research into asbestos-related diseases. It was the first time that a specific type of asbestos had been implicated in a particular cancer, for Wagner and his colleagues had found that this very rare tumour occurred only in individuals living in the Northern Cape. This was where blue asbestos was mined.

In 1962, Dr John Gilson, director of the Medical Research Council's Pneumoconiosis Research Unit at Llandough Hospital in Wales, persuaded Dr Wagner to join his team. He worked there until his retirement in 1988. During this time he had the opportunity to conduct experimental and human studies. He was the first to establish a colony of rats with lungs free from organisms causing lung disease, for use in following disease patterns after exposure to dusts. He established both intrapleural and inhalation methods for the study of lung fibrosis, lung cancer, and pleural mesotheliomas. He and his team found that asbestos dimensions were an important parameter in the induction of pathogenesis. He put together a formidable team for conducting experimental studies.

In 1964, at a New York Academy of Sciences conference, Dr Wagner made another influential contribution to knowledge of the effects of asbestos. He presented studies that showed that mesothelioma could be induced experimentally in rats by the implantation of asbestos. This set in train experiments in different parts of the world to study the mechanisms of the pathogenicity of asbestos. Dr Wagner and his team's experiments showed the importance of characterising the dusts used in the studies, showing that the morphology of asbestos fibres was of great importance: long, thin fibres were much more dangerous. A further observation was that mesotheliomas could develop not only in asbestos workers but also in their household contacts as a result of laundering the asbestos-contaminated clothes. Dust fibres from contaminated clothes were also liberated in homes, causing disease in family members. This research was pivotal in the introduction of safety standards and the banning of blue asbestos in the United Kingdom.

Dr Wagner collaborated with Dr Muriel Newhouse in studying asbestos diseases occurring in workers and their relatives from an east London asbestos factory where exposures and the prevalence of disease were high. He forged strong links with a number of investigators to look into the patterns of disease connected with the use of asbestos in different locations around the world. He was also engaged in collaborative research in many parts of the United Kingdom and in other parts of the world, such as Cyprus, Turkey, Greece and Canada, and gave freely of his help and advice.

In 1985, Dr Wagner received the prestigious Charles S Mott Prize of the General Motors Cancer Research Foundation for 'the most outstanding recent contribution related to the causes and ultimate prevention of cancer'. Despite having dyslexia, Dr Wagner published 85 research papers, as well as many book chapters and reviews.

Dr Wagner married Margaret, a haematologist, in South Africa. They retired to Dorset in 1985. He continued to be a consultant until shortly before his death in May 2000.

Aided by his son, Charles, he developed a good wine cellar. He also enjoyed archaeology, rugby and gardening, and became a respected member of the Dorset Archaeological Society.

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