THE COTTER MEDICAL HISTORY
MUSEUM

Leitz fluorescence binocular microscope

The recently-restored Leitz Laborlux (c 1965) binocular, fluorescence microscope in the Cotter Collection, uses a Leitz mercury vapour lamp to generate the UV light that excites specimens to glow (fluoresce). Despite the high UV output of that lamp, the brightness of the fluorescence from biological specimens is often weak. To ensure that signal is able to be viewed via the microscope eyepieces and/or recorded digitally, the objectives must be of the highest quality. Additionally, the geometry of the various optical components between the objective and the eyepieces is modified to ensure loss of signal-intensity is minimised. As a result, fluorescence microscopes are usually more expensive than the more common light equivalent. Currently, fluorescence microscopy is routinely used in most disciplines of science but is of particular interest as an investigative tool in medicine. Studies of cancerous lesions, bacterial/protozoan-related infectious diseases, viral interactions and biochemical reactions at tissue and cellular level will in all probability use fluorescence at some point. The instrument (figured) was donated to the Cotter Museum by the Pathology Department of Christchurch Hospital.

Historical note: In 1852, as a result of exposing the mineral fluorite and uranium gas to UV light, George Stokes was able to define and describe 'fluorescence', (the emission of a light signal of lower wavelength as a result of the exposure to light or other wavelengths of electromagnetic radiation). The first fluorescence microscope was constructed in 1911 by H. Lehmann) and only 3 years later, fluorescence-inducing organic dyes (fluorochromes) were being used to treat biological specimens especially. By the late 1930's, fluorochromes were being used to stain plant and animal tissue sections and bacterial/protozoan smears for microscopic examination.