PHOTOGRAPHING MICROSCOPIC PREPARATIONS IN THE 19TH CENTURY: TECHNIQUES AND INSTRUMENTATION

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Abstract

Photomicrography, the photography of a microscopic preparation, is certainly one of the first applications of photography to science. In order to understand its history, the study of the evolution of the microscope and its adaptation to the photographic camera is important. The first photomicrography was obtained by Fox Talbot around 1839, using a solar microscope. During the years 1839-1840, Alfred Donné and Léon Foucault produced microdaguerreotypes using the electric arc as an artificial illuminant. Despite this pioneering work by Talbot, Donné and others, slow progress was made in photomicrography, primarily due to the belief that drawing was a more appropriate medium for the illustration of microscopic preparations. However, in the following decade, several instruments combining the microscope and the camera, arranged horizontally or in a vertical position, were invented. After the mid-1860s photomicrography development was mainly due the use of immersion lenses and the Abbe condenser, and of the dry gelatine emulsion invented by Maddox, himself a keen microscopist. Following the work of Pasteur and Koch in microbiology and bacteriology, photomicrography became in the 1880s an important tool in medical research. By the end of the 19th century, with orthochromatic and panchromatic plates, crucial for histological coloured preparations, it was possible to produce and record quality images for research and teaching in several fields of science. In this paper we will provide an account of the evolution of the photomicrographic instruments and techniques during the 19th century with some scientific applications mainly in the field of medicine.