

INTERFERENCE EQUIPMENT for the **M41 PHOTOPLAN MICROSCOPE**



VICKERS INSTRUMENTS

interference equipment

The Vickers interference equipment for the M41 Photoplan Microscope, employing two alternative beam dividing phase systems, has a versatility and range of application far beyond that offered by single beam phase contrast microscopes. The halo effects and the monochromatic phase images, familiar to all users of conventional phase contrast microscopes, are replaced by vividly coloured clear edged images whose colours are directly related to the effective optical thicknesses of the specimens under observation.

By the use of suitable phase measuring devices and by observation of the coloured phase images themselves, it is possible to determine the properties, distribution and precise values of many important specimen characteristics.

The following are among some of the possible applications:—

Observations of living material.

Refractive index determinations.

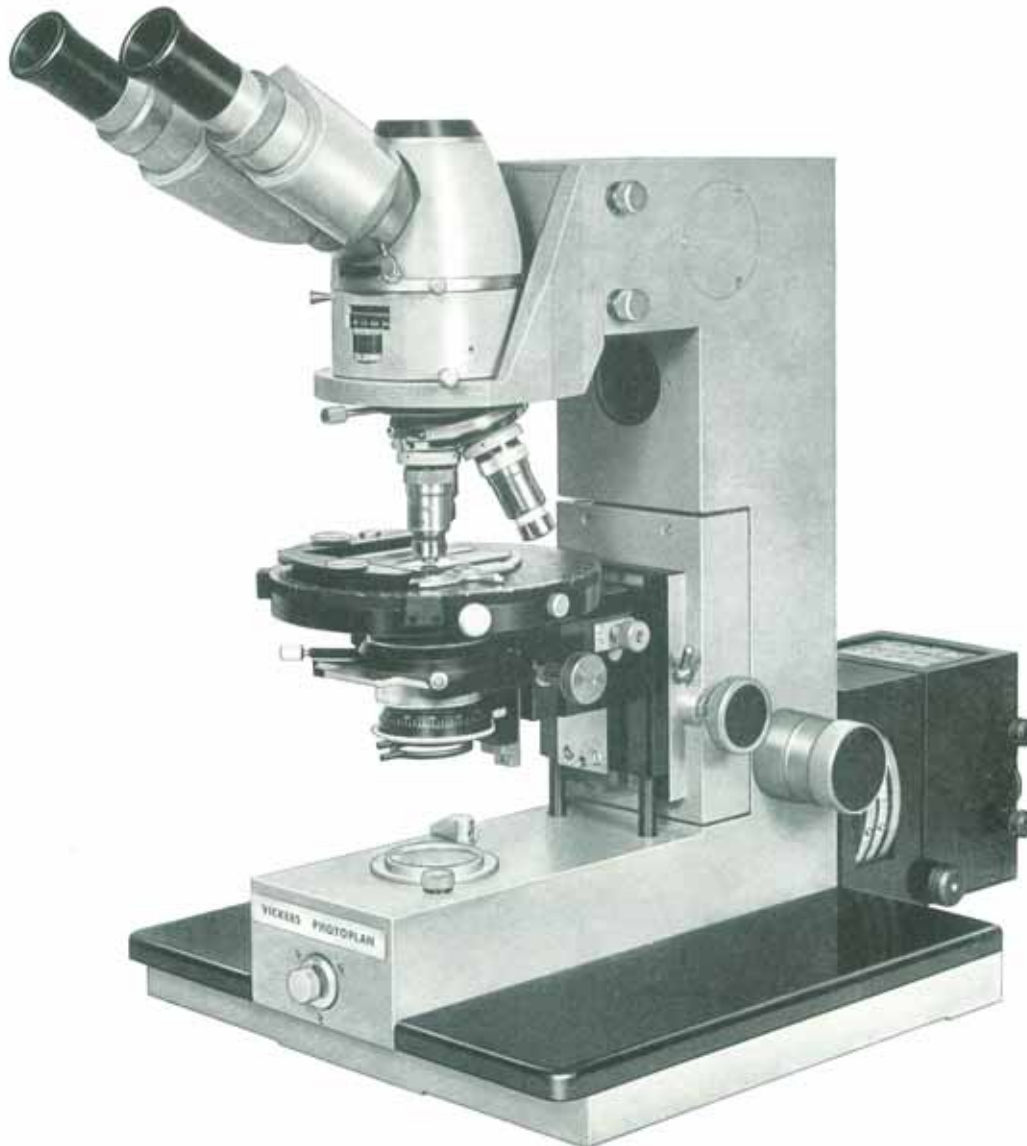
Dry mass evaluations in single cells.

In vivo observation and recording of cells or tissue growth and behaviour.

Detection of irritant particles in mine dust etc.

Structural studies in muscle and textile fibres.

Determination of thin film thickness.



METHOD

The light from the illuminator is first polarized on passing through a polarizer mounted in the microscope substage. A bi-refringent component introduced in the condenser system of the microscope produces two mutually independent beams each passing through a different part of the specimen area. The structures in the specimen through which the beams pass impart phase differences to the oppositely rotating circularly polarized waves which are then made to recombine and interfere with one another on passing a second bi-refringent plate above the objective.

Such an arrangement consisting of a balanced interferometer system producing the two mutually interfering beams, and incorporated into the microscope optics themselves eliminates the considerable inconvenience inherent in spatially separated microscope systems.

The whole instrument has been designed with maximum convenience in mind being free of any complicated adjustments and comparatively simple both in setting up and operation.

INSTRUMENTATION

The interference equipment for the M41 microscope is attached to the stand on easily removable dovetail carriers.

The microscope optical system is fitted to the stand head on a special head carrier bracket which replaces the standard bracket.

The polarizing rotating stage is mounted on a single clamp slide dovetail carrier. The Akehurst condenser carrier and the swing out polarizer are attached to the microscope substage on a dovetail slide.

Matched sets of condensers and objectives, fitted with the appropriate bi-refringent plates, together with both a rotating polarizer and analyser provide the necessary conditions for double refracting beam splitting and combining.

