IT HAPPENED THIS MONTH...

a glance at yesterday in relation to today

IN JANUARY—(1799)—Mr. Cruickshank makes some observations about sugar and fermentation. His experiments indicate that sugar is composed solely of carbon, hydrogen and oxygen. There is now reason to suppose that only substances composed of these three elements are susceptible to fermentation and that combination with a fourth element renders the process impracticable.1

Modern carbohydrate chemists know that the first step in the fermentation of any monosaccharide involves combination with “a fourth element”—phosphate. For researchers in this field, Schwarz BioResearch has a variety of sugars and sugar phosphates—many labeled with C14. Phosphorylated sugars are available on special order, labeled with P32. Also available are a number of carbohydrate-metabolism coenzymes, yeast polysaccharides, and yeast cells, labeled with C14 or S35.

IN JANUARY—(1913)—South African Journal of Science2 reports a talk by Sir Oliver Lodge, in which he says: “If potentially living matter is ever artificially produced, by placing things in juxtaposition and bringing natural physical resources to bear upon the assemblage—which is all that we can do—then it may become alive. But if this last step is taken, it will be because something beyond matter, and outside the region of physics and chemistry, has stepped in and utilised the material aggregate provided—in the same way, presumably as that in which it now steps in and utilises the material provided, say, in an egg or a seed. That is my belief, and only in that sense do I anticipate that the artificial incarnation of life will ever be possible.”

Advances in the fields of protein and nucleic acid biosynthesis make “artificial incarnation of life” seem more probable than in 1913, but meanwhile there are many intermediate problems which challenge the imagination of biological scientists. For investigations of living systems Schwarz BioResearch supplies many useful compounds. Of special significance for studies of cell replication are our C14 and H3 labeled precursors of RNA and DNA—the latest of these are the 5' nucleotides.

IN JANUARY—(1949)—there is published3 a partial analysis of the amino acid composition of pure crystalline lysozyme. The analysis, expressed in residues per molecule, shows: tryptophan 5, tyrosine 3, phenylalanine 2, aspartic acid 11, glutamic acid 3, arginine 11, histidine 1, lysine 5. The figures, especially those for histidine and tyrosine, permit the determination of a molecular weight in excellent agreement with that calculated from x-ray diffraction spectra.

For those interested in protein structure, Schwarz can supply a wide range of C14, H3, and O18 labeled, optically standardized, amino acids of high specific activity. As sales representatives of Yeda we can supply an extensive list of polyamino acids and amino acid derivatives.


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COOKE BRIEFS

Instruments and Applications

Special purpose accessory equipment for use with Cooke stereoscopic microscopes

Although in the past few years there has been much design activity related to improvements in the convenience and speed of use of low power binocular microscopes, it seems generally agreed that the superb optical qualities of the conventional Greenough type of instrument have not been surpassed. The optical performance of the Cooke M6000 Stereoscopic Microscope will satisfy the most critical user. Moreover, a very complete selection of ancillary equipment is offered which fits instruments of the M6000 series for special techniques of observation not always possible with instruments available from other makers. Some examples follow:

Examination of specimens immersed in water

Often in routine work specimens must be examined in tanks or immersed in trays. Reflections from the liquid surface can be troublesome and detract from image quality. For such circumstances Cooke supplies a paired objective of 7.5X initial magnification (working distance, 35mm) which can be immersed in water, thus substantially improving observation conditions. The objective is also useful when working distance considerations would prevent use of a standard objective because of depth of water cover.

The camera lucida

Sometimes a drawing, which can be selective as to detail, is preferable to a photomicrograph. Certainly for advanced instructional work the student can learn more by exactly drawing an object than by merely photographing it.

A special adaptor fits our camera lucida to the inclined, large diameter, eyepiece tube of the M6000 binocular body. A hardwood drawing board, tilted at an angle matching the eyepiece tube inclination, is provided.

In the camera lucida the image is seen as apparently superposed and lying in the same plane as a sheet of drawing paper. Thus, the moving drawing pencil is presented to the observer’s eye, tracing being accomplished while he looks directly at the object. To those who have never used one, it can be recommended as a most satisfactory and convenient way of working.

Use of low-power bright and dark ground condensing systems

Proper illumination of transparent specimens at low powers can be a problem. In some cases a substage condensing system (similar to that regularly employed on high power compound microscopes) may be helpful; we supply one with a 2” focal length.

Dark ground observation techniques can also be applied to our stereoscopic microscopes, and these have proven to be valuable in many applications. A low power dark ground condenser is available with a selection of patch stops appropriate to the different objectives.

True normal incident illumination

For best results in the examination of holes — and the plane, highly reflective surfaces encountered in metalurgy — illumination straight down the optical axis is most suitable. Most built-in top lighting systems give, at best, oblique illumination which is less oblique than that obtained by an exterior light arrangement.

Supplied for use with the Cooke stereoscopic microscopes is an attachable high intensity lamp, with coated plane glass reflector positioned below the paired objectives and on the optic axis — to give true normal incident illumination.

Some other special accessories

Special attachments for textile examination and measurement.
Graduated, rotating, and centering, superstage with polarizing equipment.

A Long Working Distance Objective Suitable For Use With Uncovered and Immersed Specimens

The Cooke-A.E.I. Long Working Distance Objectives, previously mentioned here, cannot be used in some applications. They are sensitive to deviations from standard cover glass thickness and are unsuitable (because of their mirror element) for use with normal incident illumination.

For work under such conditions, the M7S17 20X Long Working Distance Objective may be useful. Numerical aperture is low for an objective of this power, being 0.28, however, this objective is most versatile. A working distance of 14mm is provided; the lens can be used in either transmitted or normal incident light; it can be employed on specimens with or without cover glass (of whatever thickness), immersed or dry.

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