agar is soft enough to yield slightly and obviate damage. The nuclear changes during mitosis can then be observed under the microscope. A 2 mm oil immersion objective and 10^x compensating ocular are suitable. Under these conditions the following can be observed: The prophase nucleus appears as a spheroidal, usually slightly opalescent body, surrounded by a tenuous membrane and containing fine almost dust-like chromatin granules in active trembling motion. These granules gradually aggregate to form an annular plate. Generally this is formed in a plane normal to the surface of the slide. The nuclear membrane is still discernible at this stage. Following this the nucleus becomes flattened in the plane of the plate. Next there occurs a rapid radial shrinking of the plate, accompanied by disappearance of the membrane; almost simultaneously the plate splits in its plane, forming the daughter plates, which immediately separate and can be followed for a short time as they part. No spindle fibers can be seen, but their position is occupied by an opalescent or hyaline area into which no cytoplasmic granules intrude. By the time the daughter plates have separated for a distance of about their own diameter they show no granulation but appear as hyaline refractive disks. As a consequence of this, if it happens that division of the plate takes place in a plane other than that normal to the substrate this separation of the daughter plates is extremely hard to observe. As the plates reach the neighborhood of the cell membrane elongation of the cell begins and fine granulation is again visible in the plates and thin membranes can be seen at their surfaces. Before the cytoplasm of the two daughter cells has divided the new nuclei show definite granulation with active motion in their central portion. They possess also definite membranes with a layer of fine quiescent granulation just beneath.

The time relations of the mitotic process under these conditions are practically unchanged, as far as the nucleus is concerned; cytoplasmic fission, however, is greatly interfered with and in many cases is not completed.

At the completion of observation the amoebae are readily retrieved uninjured. If a drop of culture solution is placed with a pipette on the edge of the cover slip so that it flows beneath, the cover slip can be gently lifted from the agar without damaging the cell, which may then be transferred as desired by means of a pipette.

It is hoped that this simple method will be found of use in the study of mitosis in this and other related forms in which the granularity of the protoplasm has been a source of trouble.

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AN APPARATUS FOR COLORIMETRIC OXIDATION-REDUCTION STUDIES

THE apparatus consists of a B. and L. biological colorimeter modified so that the stationary side carries a metal cylindrical tube which fits closely over the plunger. It is kept in place on the metal at the top by 2 set screws. This tube has spring hooks at the bottom which serve to hold a detachable similar but shorter metal frame holding a cylindrical glass reaction container up to and in line with the plunger.

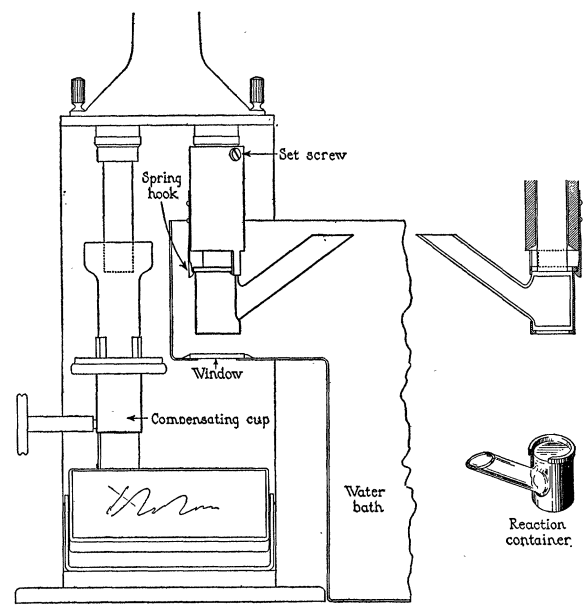

FIG. 1

The glass reaction container holds about 3 cc of fluid and is completely closed except for a side arm which comes off at an upward angle. Through this the reactants are added and the arrangements are made for exclusion of air (by evacuation or by an inert gas).

The reaction container is immersed into an extension and over a window set in the bottom of a specially designed constant temperature bath. The main body of the bath sits beside the colorimeter and does not block light reflected from the mirror which passes through the window.

The compensating cup (B. and L. 33.-27-31-01) may fulfil not only its usual function but it balances the water and glass window of the water bath.

The movable cup contains a standard solution of the dye which allows the fading curves to be followed as the reaction proceeds.

The flexibility of this simple compact arrangement with the fine control of end points makes the apparatus well adapted to dehydrogenation studies as well as to other reactions where the fading of an indicator is involved.

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