

MICROSCOPY

New Microscope Sees Cells Whirled at Bullet-Like Speed

Light Flashing on Specimen Borne by Turbine-Like Rotor At High Speed Permits Continuous Picture to Be Obtained

IT IS NOW POSSIBLE to watch the details of the behavior of cells and other objects whirled at bullet-like speeds subjecting them to a centrifugal force equivalent to about 200,000 times gravity. This can be done by means of a new combination of two recently evolved instruments, the centrifuge microscope and the super-centrifuge.

The centrifuge microscope was devised by Prof. E. Newton Harvey of Princeton University and A. L. Loomis of Tuxedo Park, N. Y. It whirls the object to be examined around on the end of a rotating arm, flashing a light on it for a brief instant at one point in each revolution, so that the series of instantaneous glimpses thus obtained can be seen, cinema-fashion, as a continuous picture. Its speed, however, is comparatively limited: with the most improved model Prof. Harvey has been able to obtain only about 10,000 revolutions per minute, giving a centrifugal force of about 12,000 times gravity.

The super-centrifuge is the invention of Dr. J. W. Beams and A. J. Weed of the University of Virginia. It is a top-shaped case of steel, with diagonally placed vanes underneath. It rests in a funnel-shaped cup, with an air inlet at the bottom. When air under pressure is admitted, it lifts the top and at the same time spins it by pressing against the vanes, turbine-fashion. In this way terrific speeds can be obtained with virtually no friction, for the rotor rides on a cushion of air. Rim velocities one-third as high as the muzzle velocity of a rifle bullet have been obtained, with centrifugal force up to half a million times gravity.

Now Prof. Harvey has adapted the principle of the centrifuge microscope to the super-centrifuge. Dr. Beams and Mr. Weed have built for him a rotor with two inclined stellite mirrors, one near the rim, directly under the place where the slide carrying the cells is placed, the other at the center, to reflect the image a second time, upward into a microscope. The new device is described in *Science*.

Each time the glass slide carrying the cells passes under a special narrow-filament light at one side, it receives a brief moment of illumination, and this is flashed through the cells, from one mirror to the other, and up into the microscope. The speed at which the device can be operated is limited by the strength of the glass slide, which will break if it is whirled too fast. Prof. Harvey estimates a force of 200,000 gravities as the limit at which the new super-centrifuge microscope can be used at present.

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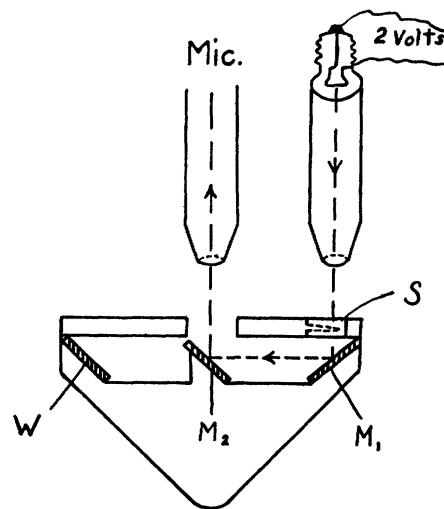
ORNITHOLOGY

Scientist Seeks Museum Specimens of Extinct Birds

WHERE are the mounted museum specimens of extinct or near-extinct species of birds?

Who has a passenger pigeon, a great auk, a heath hen? Burlingham Schurr, curator of the museum of zoology at Amherst College, wants to know.

He is broadcasting an appeal to all naturalists and museum curators to re-



FOR BETTER BIOLOGY

In the new centrifuge microscope, two mirrors (M1 and M2) are mounted on the Beams' rotor in such a position that the image of the object on a special slide (S) is reflected into a microscope (Mic) mounted above and on the axis of the rotor. W is a counterweight for balancing the rotor. The illumination is a narrow image of the filament of a straight-filament tungsten lamp.

port briefly on the specimens they have of these birds or their eggs, as well as the Eskimo curlew, California vulture, Carolina parakeet, ivory-billed woodpecker and any other birds noteworthy for rarity, giving place and date of collection when these are known. It is Mr. Schurr's intention to publish a list, making the whereabouts of these rare specimens known for the benefit of all ornithologists.

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PHYSIOLOGY

Overdose of Caffein May Cause Sterility in Males

TOO MUCH caffein, the stuff that puts the "kick" in coffee, may have a bad effect on the male reproductive physiology, even causing partial or total sterility. Such at least is the indication of experiments by Prof. Hermann Stieve of the University of Halle, reported in *Die Umschau*.

Prof. Stieve administered to male guinea pigs doses of caffein ranging from .018 to .09 grams per kilogram of body weight. They became partially or totally sterile, and anatomical examination showed degenerative changes in their reproductive glands.

However, undue alarm need not be taken by human beings, for a little calculation shows that to take in .09 gram of caffein per kilogram of body weight an average-sized man would have to swallow four or five gallons of the strongest coffee. Race suicide by the coffee route is therefore considered hardly a practical menace. But the danger that lurks in becoming habituated to caffein tablets, which some persons take freely in order to keep going under strain, is not to be minimized.

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