dollars, little, if any stress is laid on the fact that after the dough is made up, there is no "alum" in the mass. All baking powders have an excess of carbonate and the whole of the aluminum sulphate is converted into aluminum hydroxide. In the discussion of the wholesomeness of alum baking powders some attention might be given to the question of the comparatively large amount of sodium sulphate that is introduced into food by such use. The right of crystallized sodium aluminum sulphate to be called "sodium alum" is set forth in some detail in a paper published in the June issue of the *Bulletin* of the Wagner Free Institute of Science, of Philadelphia, and reprinted in *The American Journal of Pharmacy* for July, 1928.

HENRY LEFFMANN

AUGUST 20, 1928.

QUOTATIONS

MILLIONTH MAPS

THE geographers of the world assembled at Cambridge, England, have agreed that the mapping of the heavens is to be an international undertaking. They have also decided that an airman's map of the world shall be made on the scale of 1 in 200,000, which is just over three miles to the inch. This map is to show all landmarks that are prominent from the air, such as rivers, shores, railroads and forests. When the thirty nations that are cooperating in making this birdseye view of the world have finished their task, it will be possible for the aerial tourist to find his way without much more difficulty that he has in an automobile on land. For some reason best known to the geographers it has been decided to use Mercator's projection, which has taught the world an exaggerated idea of the area and shape of the northern portions of this hemisphere. An interesting innovation is the abandonment of the old system of reckoning latitude north and south of the equator and longitude east and west from Greenwich. In its place the new system is to be used of reckoning latitude from the South Pole 180 degrees to the North Pole, and of carrying longitude all the way round the globe from Greenwich.

One of the subjects which the geographers have been discussing is the work on the so-called "Millionth Map," which is to show the world and all that is upon it on a scale of 1 to 1,000,000, which means about sixteen miles to the inch. This project was first broached thirty years ago by the German geographer, Professor Penck. In 1909 at a meeting attended by representatives from various nations it was agreed that each nation should contribute maps of its own territories. A central bureau to supervise the work was established in Southampton and the European sections were at once begun.

Unfortunately, the United States has been slow in performing its part. As usual, the blame is laid to lack of funds. Of the forty-five sheets covering the United States only four have been completed, despite the efforts of the United States Geological Survey, which has charge of the work, to arouse public interest in order to bring pressure to bear on Congress to provide the money. In the meantime the American Geographical Society has been working on its "Millionth Map" of South America, and is turning out a piece of splendid workmanship. These maps may serve as part of the contribution of the Hispanic countries to the world map. Made with exceptional accuracy, they are examples of cartography which compare favorably with the work of the Swiss, German, French and English.

It may be the vast area of this country which has hampered American map-making. Compared to the maps made by any of the above-named European governments, the average American map is incomplete and unsatisfactory. In fairness to the United States Geological Survey, it must be said that the men directing the work and in the field are highly skilled and competent. But the failure of the government to improve its early surveys, and to revise the base maps at least every decade, has resulted in the maps being not only frequently misleading but also actually deficient in recording changes such as roads, railroads, bridges and shifting coast lines. It is time not only to hasten completion of the Millionth Map but also to make it possible for the Geological Survey to issue maps which will stand comparison with those of Europe.—*The New York Times.*

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A METHOD OF PROJECTION OF LOW POWER IMAGES

IN the laboratory one often wishes to draw an accurate outline of a somewhat large object. This can be done with an elaborate and often expensive drawing outfit which seldom is permitted to stand in a usable condition because of the space it takes.

I have used a simple lens with a camera lucida attached to it (very insecurely) and I have used a compound microscope with an objective of three-inch focus and the stage lowered because the rack and pinion was not long enough to permit focusing the lens on an object on the stage in its normal position. The objective may also be screwed to the end of the

draw tube and so be raised to a level at which it may be focused. In this case the nose-piece must be removed.

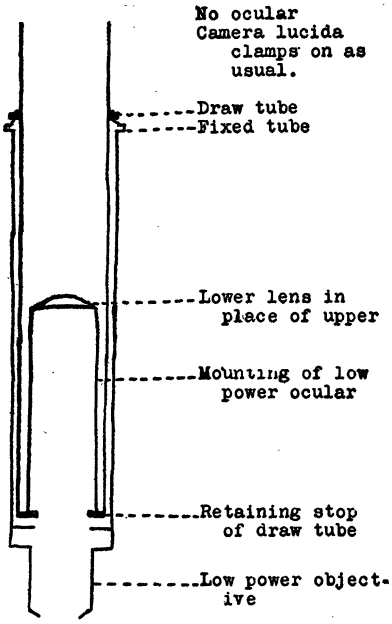

Diagram of a modification of a compound microscope for projecting low power images with the camera lucida. The stand and rack and pinion are not figured.

These methods lack firmness or adaptability and were always makeshifts.

I found an ingenious student last year using a combination which enabled him to get any magnification from ten to thirty diameters he pleased. I do not give the make of the microscope he was using, for I think any instrument with a draw tube can be used.

He took the long (low power) ocular and unscrewed the lenses, replacing the upper lens by the lower and discarding the upper lens. Then he unscrewed the draw tube, removed the retaining stop at the lower end of the draw tube, placed the modified ocular, lens upward, in the draw tube, screwed back the stop and replaced the draw tube in the microscope. He used no upper ocular but focused the instrument in the usual way. When the image was distinct he was able to increase its size by pulling out the draw tube and focusing again. I think a microscope that is constructed for 160 mm tube length will not be clear until that length is reached, but beyond that the image will be increased in size as the draw tube is lengthened.

With a camera lucida he was able to project section after section of a 10 mm pig series at sizes of ten and thirty diameters and all between.

This method may not be sound optically, but it gives clear images, increases the range of effective use of the compound microscope, and I wish I had known of it forty years ago.

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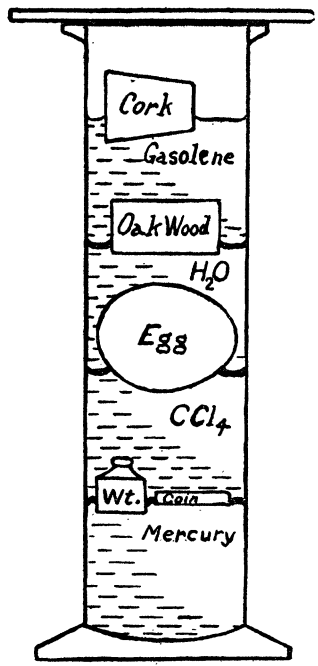
A PRACTICAL DENSITY DEMONSTRATION

THE differences in density of various liquids, the non-miscibility of these liquids and their buoyancy as expressed by Archimedes can be rather vividly demonstrated by use of the simple apparatus illustrated herewith. The liquids contained in an ordinary



hydrometer jar are mercury, carbon tetrachloride, water and gasolene, each added carefully in turn to the vessel. Objects are added as each layer of liquid is introduced. These may include a brass weight and coin, egg, piece of oak wood and cork which will float on the several layers of liquid, respectively. Gold or platinum articles will also sink in the mercury if added. When once this piece of apparatus has been arranged, it may be preserved for months, with the possible exception of the egg.

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SPECIAL ARTICLES

THE MATURATION AND SOMATIC DIVISIONS IN HYBRIDS, VARIABLES AND SO-CALLED MUTANTS

AN important feature in hybrids, which obviously has not attracted the attention which its significance demands, is the striking difference between the conduct of the chromosomes in the meiotic and somatic