A large amount of trustworthy information has been derived concerning the abundance, densities, distribution and behavior of the various chemical elements in the atmospheres of the sun and stars. For years to come no student concerned with these interesting matters can afford to overlook this important, vigorously written, and beautifully printed monograph.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A METHOD FOR MOUNTING SPECIMENS OF DROSOPHILA ON MICROSCOPIC SLIDES

MANY students of the genetics of Drosophila must have felt the need for a reliable method by which specimens could be preserved in their natural condition of coloration and structure. It is especially desirable to keep as permanent records unusual specimens, such as the various types of aberrant flies which are frequently sterile. With the view of meeting this need, the writer has experimented with various methods for mounting flies on microscopic slides. As a result of these efforts, a method has been found that not only preserves the life-like appearance of the fly, but also has every indication of giving preparations of a permanent character. The following brief description of this method is given with the hope that it may be found useful to other workers in the field. It is possible that the method can be employed for mounting other types of insects that are not well adapted to the usual pinning process.

A microscope culture slide with a depth of 1.5 mm has been found to be the best for Drosophila. The concavity is first covered with a thin layer of ever-ready mucilage or glue (Stafford's); then, working under a binocular microscope and with the aid of a pair of dissecting needles, the fly is arranged in the desired position in the center of the concavity. The glue hardens in a few minutes, and serves to hold the specimen in a definite position during the subsequent treatment. As soon as the glue is set the slide is placed in a jar containing equal parts of absolute alcohol and xylene (Baker's) and left for thirty minutes. It is then transferred to absolute alcohol and left for at least three hours. The preparation is completed by filling the concavity with Euparal (Grubler's) and applying a cover glass.

If the best results are to be obtained, it is necessary to take the following precautions: (1) The slide must be absolutely clean, otherwise the glue will crack loose and allow the fly to float off in the liquid. (2) The specimen to be mounted should be at least two days old. Newly emerged or young flies tend to become distorted in the alcohol-xylene mixture. (3) It is desirable to prevent the fly from making any movements before the glue has hardened. This can be done by holding a small wad of cotton, saturated with ether, just above the fly for the two or three minutes that it takes for the glue to set. These preparations have the advantage of permitting examination of both the upper and lower surfaces of the mounted specimen, and if it be desired, a drawing can be made at any time.

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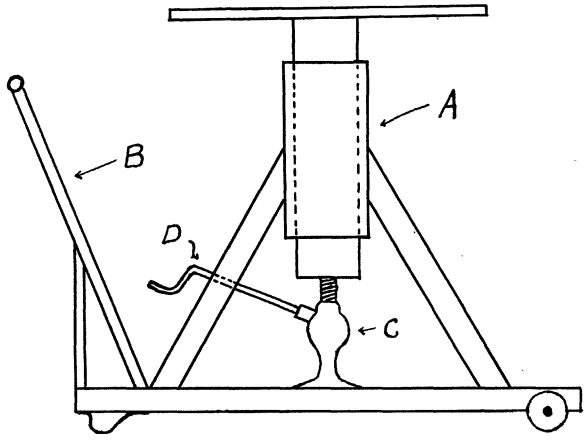
AN ADJUSTABLE APPARATUS STAND AND TRUCK

THE average laboratory apparatus stand is quite unwieldy with regard to height adjustment and mobility if the stand is loaded with a heavy piece of apparatus. It is true that some stands are equipped with rack and pinion for adjusting, but the cost is usually prohibitory.

In order to overcome these difficulties in case of a small spectrograph, which it was desired to move quickly from one part of the laboratory to another and to adjust in height, the scheme shown in the figure was adopted.



An ordinary laboratory stand A was mounted on a very low truck provided with rubber-tired wheels in front and sliders at the rear. A handle B was provided for easy manipulation. An ordinary automobile jack C was used as the means of raising the adjustable part of the stand The jack used was of the "double extension" type, giving a lift of about 8 inches. Since the height of the stand at the lowest point was arranged to be about that of an average

laboratory table, 8 inches lift was quite adequate for most purposes. The adjusting handle D was arranged so that a person seated and looking through a spectrometer would find no difficulty in making the necessary height adjustment. The stability of the truck for photographic purposes is excellent.

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SPECIAL ARTICLES

GROWTH RATES AND RACIAL SIZE IN RABBITS AND BIRDS

IT is a thankless task to try to correct an error which has crept into scientific literature, but at times necessary, unless error is to be allowed to continue indefinitely. A case in point I find in the work of a former pupil who was allowed to study observations of my own upon the growth rate of rabbits and to publish conclusions based upon them in which I am unable to concur. To be specific, I find in a recent interesting and important paper by Riddle[1] and others this statement, "Robb found that the percentage growth-rate from birth to puberity is the same in these two races of rabbits, but after puberty this rate is more depressed in the small race." The two races mentioned in the quotation are my own Flemish Giant (large size) and Polish (small size) races, and the data used by Robb were supplied from observations which I had personally made and they were later published elsewhere in greater detail.[2] Robb[3] says (p. 308), "During the fourth month Polish and hybrid animals undergo a more rapid retardation of growth than do the Flemish Giants. Their growth rate values, *which have been indistinguishable hitherto* (italics mine) diverge at this time." The point which I wish to emphasize is that the growth rates are *not* identical in the large and small races at any time, either subsequent to birth or prior to it, as shown by Castle,[2] and Castle and Gregory.[4] The large race not only undergoes cell division prior to birth faster than the small race but also grows at a faster rate after birth, so that the growth curves of the two races steadily diverge. Nor is the percentage increase in weight by 10-day intervals the same in the two races as Robb suggests. This is shown in detail in my Table 4 (1929, p. 433)[2] from which I will reproduce the data for females only (the largest group).

TABLE

PERCENTAGE INCREASE IN WEIGHT BY 10-DAY INTERVALS OF LARGE RACE AND SMALL RACE FEMALE RABBITS

Age in days	Large	Small	Difference
0– 10	221	207	14
10– 20	72	67	5
20– 30	67	70	−3
30– 40	45	34	11
40– 50	25	22	3
50– 60	20	16	4
60– 70	16	15	1
70– 80	15	12	3
80– 90	13	11	2
90–100	12	9	3
100–110	11	8	3
110–120	9	5	4
120–130	9	6	3
130–140	8	4	4
140–150	7	3	4
150–160	6	4	2
160–170	4	2	2
170–180	4	3	1
180–190	4	4	0
190–200	3	1.6	1.4

Except for the single age group (20 to 30 days), the growth rate of the large race is consistently higher. For some statistical reason which I can not explain the small race gain in that period is apparently higher, but it falls back into its proper place of more retarded growth rate in the next period (30 to 40 days) and there remains. In his zeal for "the equation for autocatalysis sponsored by Crozier" Robb overlooked the consistent difference in growth rate between the large and small races, and assumed the existence of two distinct growth cycles. I had hoped that my own publication of the complete data without comment would be a sufficient correction of Robb's mistake, of which I was not aware until I came to study the data myself, subsequent to the preparation of his manuscript, but since his conclusions rather than my own are accepted by even such veteran investigators as Riddle, I think it imperative to point out that the two are inconsistent. Dr. Robb will, I am sure, acquit me of any ill will, either in seeming to have been a too lax critic of his own work in advance of its publication or a too severe critic afterward.

The important general conclusion to which all our studies of size inheritance in rabbits point is that differences in adult body size are determined primarily by different growth potentials inherent in the gametes (eggs and sperm) of each race. The effects of these

[1] O. Riddle, D. R. Charles and G. E. Cauthers, *Proc. Soc. Exp. Biol. and Med.*, 29: 1216–1220, 1932.

[2] W. E. Castle, *Jour. Exp. Zool.*, 53: 421–454, 1929; *ibid.*, 60: 325–338, 1931.

[3] R. C. Robb, *Brit. Jour. Exp. Biol.*, 6: 292–310, 1928.

[4] W. E. Castle and P. W. Gregory, *Jour. Morph. and Physiol.*, 48: 81–104, 1929; SCIENCE, 73: 680–681, 1931; *Jour. Exp. Zool.*, 59: 199–211, 1931.