been closed and the shields varied to suit the occasion. Specially prepared and analysed J. & J. cotton was the absorbent used. The absorbent was cut to the circumference of the cup and was weighed before and after application and the difference and time noted.

Description of Devices:

Fig. I—Cross-section: A is the cup, B the absorbent and C the flange which fits to the surface.

Fig. II—Cross-section: A is the cup, B the absorbent, C the flange, D the neck of the cup and E a tube leading from the neck which can be secured to the same either by threads or other suitable means or can be made continuous with the cup. The purpose of the tube E is to produce pressure or vacuum in the chamber by its being connected to a pump or other device for that purpose.

Fig. III—Side view: A is the chamber, C the flange, D the neck of the cup, E the tube leading off from this neck and F are apertures in the side of the cup. In this cup is contained the absorbent. E is connected with a suction or pressure device. This method produces a circulation of air in the cup because of the apertures F. The cup may be constructed with an additional part so that the apertures can be closed and in that way its purpose will be identical with that of Figure II.

Fig. IV—Cross-section: A is the cup, B the absorbent, C the flange, E is a tube connected to a channelway G running around the cup and opening into the cup by means of slits. The tube E can be connected with a pressure or a vacuum device so as to produce negative or positive pressure in the cup or there may be holes in the top of the cup so that a circulation of air is produced. The top may be so constructed that holes in it can be opened or closed.

Fig. V—Side view: This is a side view of Fig. IV in which A is the cup, C the flange, G the channelway around the cup and F openings from it into the cup.

Fig. VI—Cross-section: A is the cup, B the absorbent, H an electrode imbedded in the absorbent and I the wires leading from the electrodes. The principle of this device is to measure the conductivity through the absorbent as the perspiration is being absorbed.

Fig. VII—Cross-section: A is the cup, B the absorbent, C the flange and J is a thermometer. The principle of the thermometer is to measure the temperature change in the absorbent. In this case the cup can be made of non-heat conducting material as desired.

The measurement of the amount of sweat in a given length of time and from a given area under similar and varying conditions is the aim of the above devices and procedures. The additional factor that the devices described are simple, easily applicable over a given area from which sweat is desired, and the estimations are not complicated should add to their practicability and assure their early usage. Certainly this procedure is less complex than many which are daily routine in the well equipped hospitals of to-day. In a later paper the author will discuss variation in the secretion of sweat under diverse conditions.

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DOUBLE PLATE METHOD USED FOR CULTURING TILLETIA LEVIS

A new procedure has been followed whereby pure cultures of *Tilletia levis* may more easily be made. The bottom of a petri dish is covered with a two per cent. potato dextrose agar and allowed to cool until all the moisture is gone from the top of the plate. Then the top of the dish is poured with a three per cent. non-nutrient agar somewhat cool. The agar is poured in the center of the lid until an area about one and one half inches in diameter is covered.

Streaks of sterilized smut spores are made across the non-nutrient agar with a loop needle. These are then incubated for ten days at 12° to 14° C.

As is well known, the sporidia of *Tilletia levis* are ejected from the sterigmata and in the double plate they fall to the nutrient agar below where they can be picked off singly or grown into multisporidial cultures free of contamination.

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SPECIAL ARTICLES

INBREEDING IN ALFALFA ESTABLISHES A HIGH DEGREE OF HOMOZYGOSITY[1]

A previous report[2] of alfalfa-seed investigations at the Utah Station indicated that about 2 to 2.5 times as many pods were set when artificial tripping was practiced. A considerable number of pods developed from flowers which showed no evidence of having been tripped.

An inbreeding experiment of considerable proportions, the data from which are just now available[3] make clear that alfalfa in one of the famous seed-growing areas in the Uintah Basin, Utah, is much less heterozygous than has been thought. As conducted, the experiment did not establish what proportion of the seed pods developed under conditions of natural self-fertilization. Although this would be difficult to

[1] Contribution from Department of Agronomy, Utah Agricultural Experiment Station. Publication authorized by director, June 15, 1931.

[2] Carlson, J. W., "Artificial tripping of flowers in alfalfa in relation to seed production," *Jour. Amer. Soc. Agron.*, 22: 780–786 (1930).

[3] Carlson, J. W., and Stewart, G., "Alfalfa-seed production," Utah Agr. Exp. Sta. *Bul.* 226 (1931).