to feed, at times ravenously, as soon as they were removed to a sterile nutrient medium. This same method may possibly be useful for the sterilization of the trophozoite stage of other intestinal protozoa.

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A Standardized Method for Pollen Air Analysis.*

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Pollen air analysis has come to play an important rôle in the diagnosis and treatment of allergic diseases caused by weeds. The usual method of determining the amount of wind-borne pollen is as follows: A portion of a glass slide is marked off near the center and thinly coated with vaseline, glycerine, or corn oil. It is then placed in a horizontal position or at an angle in some exposed situation for 24 hours. The slide is taken to the laboratory in a closed container, and the pollens on the ruled portion are identified and counted with the aid of a mechanical stage and a micrometer ocular.

Comparisons of slides placed in various sections and situations in New Orleans throughout 1929 revealed a great difference in the numbers and percentage compositions of pollen of various species. Very high counts were often obtained in the heart of the business district, and at the same time low counts prevailed in the residential and suburban districts. Slides placed on different sides of the same building at the same time, showed marked discrepancies in both numbers and species of pollen. In addition, relatively low counts were obtained during periods of marked hay fever, and *vice versa.* These results were, no doubt, directly related to the degree of exposure.

This diversity in the percentage of pollen of a given species in a given situation raised the question as to whether one might not get a great difference on slides placed in one location simultaneously, and exposed in positions varying from the horizontal to the vertical. Accordingly, slides were exposed at various inclinations with the horizontal and counts were made. The vertical slides showed more pollen on windy days, provided they were exposed perpendicular to

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the direction of the wind. The horizontal slides revealed more pollen on calm days. These results are explained by the fact that pol-

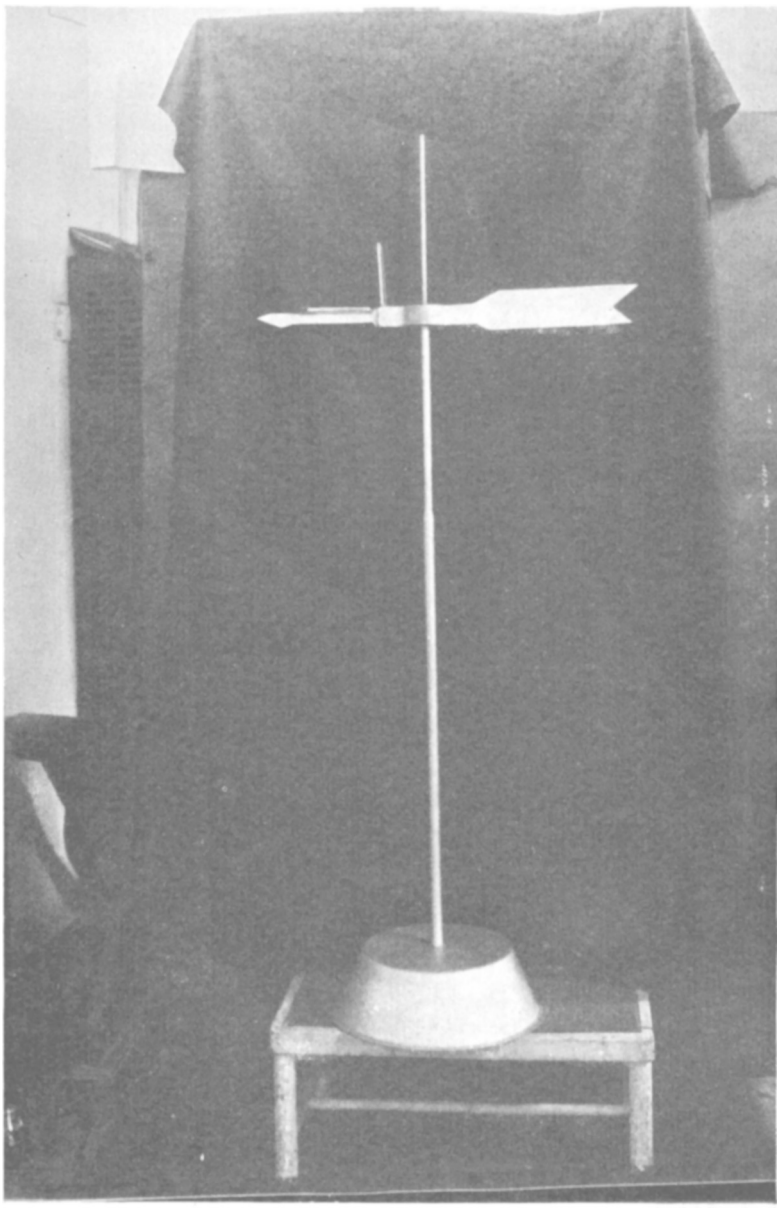

FIG. 1.

len are continually settling out of the air unless they are supported or carried in the reverse direction by the air currents. Duke has demonstrated the pollen content of still and moving air. Scheppegrell[1] has determined the distance traversed by pollen of different size. He showed that the smaller, lighter and more spiculated the pollen, the greater distance it would be borne by a wind of a given velocity. He also showed that the length of time a given pollen grain remained in the air was directly related to the rate of air movement. On calm days, the pollen grains are continually falling, whereas in moving air they may be moving horizontally or upward.

Accordingly, an apparatus was designed to determine more accurately the relative percentage of pollens falling or being supported by the air at a given time.

The apparatus consists essentially of a weather vane on which were mounted 2 slots into which microscopic slides could be inserted. (Fig. 1.) The base consisted of an inverted pan 8 inches in diameter filled with concrete into which was secured an upright support 3 feet and 6 inches high. A sensitive weather vane, made of sheet metal was mounted on a roller-skate bearing at a point 9 inches from the top of the upright rod. The slots were 1¼ x 3½ inches, the phlange of sheet metal holding the slides being 1/8 inch wide all the way around except for the slide opening. In the case of the horizontal slot a key was necessary to keep the slides from being thrown out by the wind. The vertical slot was soldered on the metal strip just in front of the roller bearing support and the horizontal slot was mounted just in front of the vertical.† (Fig. 2.)

The apparatus was placed on the top of the Tulane University Gymnasium, which is several hundred feet from any effective obstruction, and counts were made over an extensive period. A few typical examples are here presented. On November 6, 7 and 8, the vertical slides showed 17, 1 and 4 ragweed pollens per square centimeter respectively, whereas the horizontal showed 7, 2 and 1 pollens for similar areas. On January 14 and 20 the vertical slide showed for American elm 120 and 3 and the horizontal slide 20 and 2. On the same dates 92 and 3 red cedar pollen were found on the vertical and 41 and 7 on the horizontal. In comparing these data with the weather charts a relatively greater number of pollens were found on the vertical slides on windy days, and on the horizontal slide on calm days. The counts on the horizontal slides, therefore, are not

[1] Scheppegrell, W., "Hay Fever and Asthma," Lea & Febiger, 1926.

† The apparatus was constructed by Louis T. Walsdorf, 8320 Plum Street, New Orleans, La.

good indices of the amount of pollen which is carried in the air. It is believed that pollen counts on vertical slides are essential if one is to obtain a good index of pollen abundance in the air.

The ratio of the number of pollens on the vertical slide to that on the horizontal was noted and called the buoyancy index. If these ratios are calculated over a considerable period of time they should indicate the relative buoyancy of the various pollens. The buoyancy indices for those pollens studied in detail were found to be as follows: Ragweed 4, elm 5, and red cedar 2.

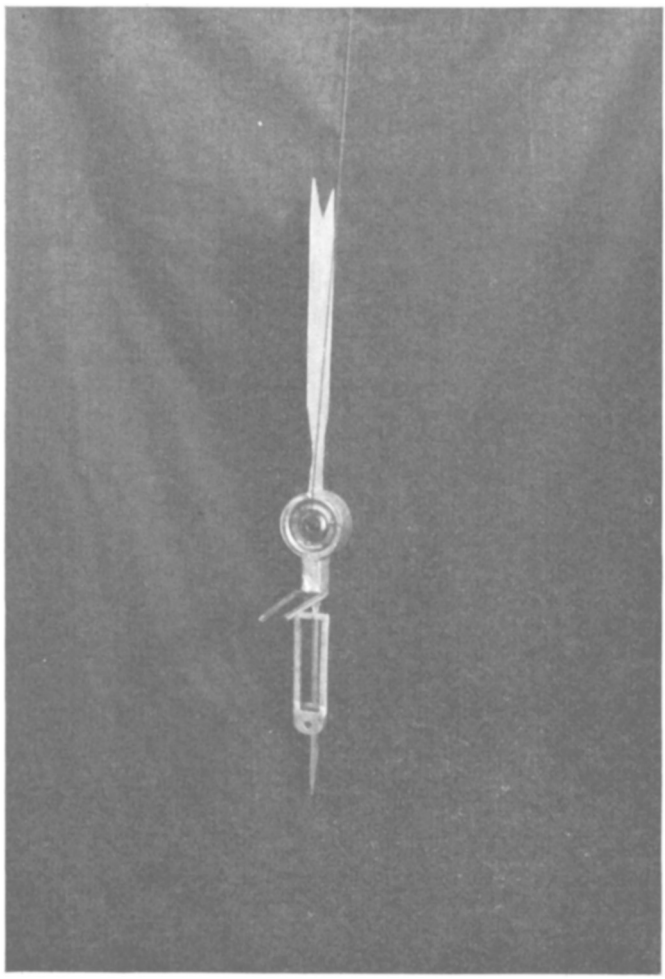

FIG. 2.

Summary. 1. The present methods of making pollen counts were found to be inadequate. 2. An instrument was devised and is here presented which gives a better conception of pollen abundance in the air. 3. The importance of the pollen count on the vertical slides is emphasized. 4. The buoyancy index is presented as a graphic means of determining the relative buoyancy of the various pollens.