

ing upon each other, some are carried into the water by their own velocity and some are thrown into the water by the force of the blows received from other molecules, thus decreasing the number in the vapor and allowing others to escape from the water. When the number that escape and the number that are carried and thrown back into the water equal each other a condition of equilibrium is established and the space is said to be saturated.

If the temperature of the space or the vapor within the space now be raised, what will happen?

The molecules of vapor at a temperature of 40° F. have a given velocity and amplitude of motion. The increase of the temperature from 40° to 50° increases their velocity and movement, and to exercise this increased activity requires more space. We, therefore, are accustomed to say that the vapor expands or increases in volume when its temperature is raised. In expanding some of the vapor overflows the original space, and the number of molecules within the space is thus decreased by the number that has been crowded out of the cylinder. This destroys the condition of equilibrium and permits the molecules at the surface of the water to escape again in greater numbers. Thus, the process of evaporation continues, establishing finally as before a condition of equilibrium at the new temperature of 50° F. This is our understanding, why increased temperature gives increased capacity when the vapor is free to expand, except for the control of gravity. But if we put a lid on the cylinder and thus confine the vapor to a definite space we limit the field of its activity but not the activity itself. The effort of vapor, humidity, steam, water gas—whatever name we may use to designate it—to obtain more space increases with its temperature whether confined within a limited space or not. If the space is limited the effect is increased pressure; if not limited increased volume. In either case it obeys the laws of gases. The only difference between atmospheric moisture and steam is that the activities of the former are limited by gravity alone, while the activi-

ties of the latter are confined to a definite space.

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A VARIANT IN THE PERIODICAL CICADA

WHILE collecting material for a study of the mode of pigment formation in the periodical cicada (*Tibicen septendecim* L.) my attention was attracted by an adult male in whose eyes the red pigment was lacking. The specimen was secured at Summit, N. J., on June 6, and although the cicadas occurred there in countless thousands I searched in vain for a second specimen.

The example secured differed from the usual form not only in lacking the red pigment of the eyes, which in this specimen are perfectly white, but also in the coloration of the wing veins. In this individual the costa of the fore wings and the costa and the greater portion of the radius and media of the hind wings lack the typical orange coloration and are perfectly colorless.

Morgan¹ has recently caused white-eyed mutants to occur in *Drosophila* by closely inbreeding and it may be that this specimen originated in the same manner if we assume that the entire colony is descended from one pair of cicadas. A study of the inheritance of this trait would be very interesting, but such a study is obviously impracticable owing to the long period of adolescence.

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QUOTATIONS

TRIPPED BY RED TAPE

THAT the Department of Agriculture should be in danger of losing three of its leading experts on food adulteration, Wiley, Bigelow and Rusby, on account of a technical violation of the salary regulations, shows how a government is hampered by its bureaucratic methods. It is not claimed that Professor Rusby, of Columbia University, was avaricious in refusing to work for \$9 a day or that the departmental authorities who arranged for him to be paid at the rate of

¹ Morgan, SCIENCE, N. S., XXXIII, No. 849, p. 534, April 7, 1911.