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 activities 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.

Morgan[1] has recently caused white-eyed mutants to occur in *Drosophilia* 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.

$20 for part of the year were wasting public funds. Any one of these three men, if he had been willing to put his knowledge of chemistry at the service of an adulterator of food or an evader of customs, could have made a great deal more money and had a much easier time of it.

It is not merely a pecuniary sacrifice which must be made by men of exceptional ability and proficiency when they enter any branch of government employ. A greater deterrent is the fact that they find that they are not free to work in their own way but have to submit to the detailed dictation of a lot of clerks and lawyers. This is particularly the case with the scientific departments. The scientific temperament is in eternal conflict with the legal temperament. The one cares only for results; the other insists upon methods. The former is striving for something new; the later sticks to precedents. Consequently the scientific men in government employ are apt to be in a chronic state of irritation unless they are of the conventional routine type of mind, that is to say the unscientific type of mind. In the case of a high spirited and original genius this irritation sometimes rises finally to the pitch of exasperation and he goes off on a tangent, sending in a farewell letter to "the department" telling them just what he thinks of them for refusing to pay for that tin cup which he bought without the proper requisition or for sending back his last report because only one color of ink was used on it. Men of calmer temper will get along somehow rather than give up work they are interested in, paying for the things that are necessary but not allowed, out of their own pockets, or collecting money on the side from some patron of science, and resorting to various evasions and misclassifications to get within the letter of the law. Probably the strict and literal enforcement of all the regulations in any department would stop its work. We have experimental evidence in support of this supposition, for in France and Italy it has been tried in the government railroad and postal service, where the employees instead of striking decided to obey the rules, all of the rules, all of the time. The result proved that obedience was better than sacrifice of wages because it was more effective in tying up the traffic.

The United States government has been remarkably liberal in its appropriations for scientific purposes, both theoretical and practical, but the results have not always been commensurate with the expenditure, partly because of the conditions under which the work had to be performed. By a process of natural selection the men of greatest initiative and originality tend to be eliminated out of the system. This is why the phrase "Washington science" is so commonly used in a derogatory sense.

Now the Bureau of Chemistry, under Harvey W. Wiley, for the past twenty-eight years has succeeded in keeping out of the ruts. It has set a fast pace for the state agricultural experiment stations. It has made many original contributions to science. It has initiated many valuable reforms in legislation and in agricultural practise. Dr. Wiley has a good temper. He laughs and grows fat on worries and opposition that would drive some men mad. He has been able to live in a bureaucratic atmosphere without losing his scientific spirit, or, what is more remarkable, his zeal for reform.—The *Independent*.

DOCTOR WILEY

(With apologies to Rudyard Kipling)

"What makes the Potted Ham so green?" said Files-on-Parade.

"It's feelin' fresher than it is," the Color Sergeant said.

"What makes the ranks so white, so white?" said Files-on-Parade.

"They're dreadin' what they've got to eat," the Color Sergeant said.

"For, they're bouncin' Doctor Wiley, you can hear the Microbes cheer,
And the Germs is all a-singin' 'Wiley's goin' away from here,
And we're comin' back far stronger than we've been for many a year,
For they're bouncin' Doctor Wiley in the mornin'.'"