

with the spark has the same effect as increasing the current. It is possible to obtain the glow from hot calcium oxide providing the discharge is kept very small.

The shape and position of the electrodes have no appreciable influence on the production of this glow. It is produced equally well from platinum and from iron electrodes and in tubes made from soda and from lead glass. It does not appear to depend on the purity of the mercury.

It requires approximately .001 sec. for the glow to die out after the exciting current has ceased. As a result of this continuance of the glow the radiators may continue to give light while being carried with the current of mercury vapor for 20 or 30 cm.

These radiators do not appear to be charged. Thus if the luminous vapor containing them is passed through wire gauze, no effect is produced on the intensity of the continuous spectrum when the gauze is charged negatively. This is quite different from the behavior of the radiators of the line spectrum which may be entirely removed by this means. It is possible in this way to obtain the continuous spectrum without any of the line spectrum appearing.

As far as has been observed there are no lines or separate bands in the spectrum here described. It is, however, possible that a spectroscope better than the one at the command of the writer may show such lines.

It appears probable that we are here dealing with a vapor which is intermediate between a gas and a liquid. When a gas is condensing there must be a time when two or more atoms have combined to form clusters. Such a vapor might be expected to give a spectrum intermediate between a line spectrum as given by a gas and a continuous spectrum as given by a liquid or solid. This is a fact the kind of spectrum here observed.

Further work is being done on the subject and it is expected that the results will soon be published in more complete form.

C. D. CHILD

COLGATE UNIVERSITY,
August 6, 1920

A NEW VARIETY OF THE ROOF RAT

DURING the second week of March of this year Miss Jane F. Hill, one of our students, brought to the laboratory about a dozen rats, which had been taken on her father's farm. The farm is located fifteen miles from Austin, in Travis County, Texas. Seven of these rats were cinnamon in color, the others, obviously the wild type, were gray or brownish. The cinnamon color is restricted to the back and sides of the head and body, and is due to the presence of yellow pigment in the outer ends of the hairs, the pigment of the hair base probably being chocolate. In the type and mutant specimens the fur on the ventral surface, from the chin to the base of the tail, is snow white, the hairs being white from the tip to the base.

We attempted to keep these rats in the laboratory, but after a few weeks they began to die. I then instructed one of our assistants to preserve the skins. Some of these were later sent to Professor W. E. Castle, who showed them to Dr. G. M. Allen. Dr. Allen identifies the species as the roof rat, *Mus alexandrinus*.

We were anxious to establish a stock of the cinnamon rat for genetic studies, and through the kindness of Miss Hill and her family, I was able to visit the farm on July 6. During the day we captured 215 rats. Upon examination, the rats proved to be of three varieties, *Mus norvegicus*, *Mus alexandrinus*, and the cinnamon mutant. We took 61 specimens of the common Norway, 138 of the type of roof rat, and 16 of the cinnamon. Undoubtedly some of the 138 specimens of the roof rat are heterozygotes. We were fortunate enough to capture a mother and four young in one nest. Three of the litter are like the brownish-gray mother, and the third a typical cinnamon.

The interesting point concerning the discovery of this cinnamon rat relates to its origin. When and how did it happen to appear on the Hill farm? With a view of answering these questions, I made a careful study of the conditions on the farm. The farm buildings where the rats are found are close together and

are fairly well isolated. With the exception of one neighboring place, located about 400 yards from the Hill buildings, all other neighbors are at least a half mile distant. The cinnamon rats had not been observed prior to last Christmas, when Miss Hill saw a single animal in the grain house. From time to time others were seen in increasing numbers about the place.

The rats in the farm buildings have reached such numbers that they have become very destructive. This coupled with the fact that bubonic plague has appeared in Texas, made it necessary to attempt their extermination. During the past few weeks over 1,000 rats have been killed, and among these were found a number of the cinnamon variety. From the best available data, I estimate that at present the proportion of cinnamon specimens to all others is about 15 to 200.

The cinnamon rat has not been observed at any of the neighboring places, with the exception of the one located 400 yards away, where two animals were recently seen. All of the evidence points to the conclusion that this new variety arose, possibly as a mutation from *Mus alexandrinus*, on the Hill farm some time during the latter part of last year.

This rat should furnish an opportunity for some interesting genetic studies. In a recent letter Professor Castle has called attention to the value of this material. He says:

This would be very interesting genetic material for there is known to be a yellow variety of the roof rat, in addition to the black variety (*Mus rattus*), and if this cinnamon variety can be added to the number (with albinism, which I presume must exist among roof rats), it would be possible to work out from this material a parallel series to that which occurs in the Norway rat, possibly even a more complex series, and it would be of interest to know whether the linkage relations are the same in the two species.

J. T. PATTERSON

AUSTIN, TEXAS,
July 22, 1920

ANOTHER CORN SEED PARASITE

A FUNGUS which seems to have had very little consideration as a parasite has recently

been isolated from sweet corn seed by the writers while making a study of the internal parasites of some agricultural seeds.

This fungus was frequently found in corn from a field that last year had many dwarf and distorted stalks and some barren stalks and root rot. Seeds of this corn were examined for internal parasites by treating three minutes with corrosive sublimate solution according to a method which the authors have worked out and found to be very satisfactory. After this external disinfection they were planted in sterile tubes of nutrient solution on cotton. In about a week a white fungus had grown out from many of the seeds, some of which had also germinated. The roots of the seedlings were attacked by the fungus and died in about two weeks. Healthy seedlings in sterile tubes were inoculated and died in five to nine days.

The pathogenicity of the fungus was further tested under more normal conditions on corn grown in pots in the greenhouse, by pouring a suspension of the spores from pure cultures around the roots and by punctures with an infected needle just above the ground. Several of the plants so infected showed the dwarfness and distortion seen in the field the previous year. Those inoculated by puncture made 19 per cent. less growth in height than the controls and the soil inoculations made 13 per cent. less. Fungous mycelium was found in the discolored tissue at the base of the stem of these infected plants and the original fungus was obtained in cultures from this diseased tissue.

This fungus corresponds very well, so far as one of its methods of spore formation is concerned, with descriptions and figures of *Oospora verticilloides* Sacc., found on corn in Italy by Saccardo in 1877. It was extensively studied by Tiraboschi¹ in an investigation of organisms in corn that might be connected with pellagra. Tiraboschi, like practically all other students of corn diseases, apparently overlooked similar work done in Russia in 1895 and 1896 by Deckenbach, who in addi-

¹ *Annali di Botanica*, 1905.