produced by inoculation of the third-passage chorio-allantoic membrane are shown in Table I.

Volunteer No. 124 began to cought at 9 P. M. on the evening of the day of inoculation. The next morning the cough was worse, and he had a considerable degree of watery coryza and a slight soreness of the throat. Symptoms increased in intensity on the day following, remained about the same for another 24 hours, and were considerably abated on discharge 5 days after inoculation. Almost the identical series of events occurred with Volunteer No. 125, except that in his case, cough was more marked at the onset, and coryzal symptoms did not reach their maximum until 4 days after inoculation. Both men declared they had experienced head colds of full average severity; no constitutional symptoms of the influenzal type, such as general malaise and fever, were noted.

In summary, then, freshly obtained virus-containing material from a human cold was implanted on the chorio-allantoic membrane of the developing chick-embryo and passed through a series of 3 eggs. Material from the third series of eggs when tested on 2 human volunteers by intranasal inoculation produced in each instance a typical experimental cold. Dilution of the original material inoculated was so great that it seems unlikely that infection was due to the survival of a sufficient amount in the active state.

8914 C

Immunization in Rats Against Trichinella Spiralis.

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Attempts were made to immunize 35 white rats against *Trichinella spiralis* by way of the mouth.

These rats were formed into 3 groups, fed respectively on (1) trichina antiserum, (2) well-ground dehydrated trichina powder and (3) consecutive feedings of increasing doses of infested meat. A fourth group of 12 rats were injected intraperitoneally with varying amounts of Coca's alkaline suspension of trichina powder, as another possible method of protection against otherwise lethal doses of trichinous meat. Simultaneously, a series of normal rats were

used as controls. A total white blood count and differential were made in each of the 47 rats every second day, and symptoms were observed and recorded.

In Group One, each 3-month-old rat was fed from 6 to 9 cc. of rabbit antiserum (titer 1-10,000) and convalescent serum from trichinous hogs (negative titer) 24 hours before feeding them with the infested meat. Neither serum gave protection; rats died as early as the sixth and as late as the sixtieth day after infestation, all, including the normal serum controls, suffering from severe symptoms. No rat that died before the twentieth day after infestation showed an eosinophilic increase; 2 that lived for 60 days showed an eosinophilic count of 11% and 14%, which occurred on the thirty-second and the thirty-fourth day, respectively. Muscle larvae were found only in those rats that died after the twentieth day of infestation.

In Group Two, rats 3½ months old were fed with the fine dehydrated trichina powder over a period of 4 days before and for 20 days after feeding them with trichinous meat, which gave no protection. A lethal dose (5 gm. of meat with an average of 5 worms per low power field) was given to each rat, producing in each severe symptoms and death before the forty-fourth day. In each rat living over the eleventh day, an eosinophilia of from 5% to 17% was observed. Muscle larvae (from 5 to 30 per field) were present in both powder-fed and normal rats.

Group Three, consisting of rats 3 months old, was fed every fifth day with increasing doses of trichinous meat, and evidenced protection against large lethal doses fed later.[1] After a 10-day period, in which 2 doses of 0.5 gm. of infested meat were administered, mild symptoms were observed. Following a third feeding of one gm. (6 worms per field), a mild diarrhea was noted; however, in subsequent feedings of from 2 to 10 gm. (5 to 15 worms per field) no symptoms appeared. In this group only one rat died; all others lived through repeated feedings of infested meat, even though the last feeding of 10 gm. (15 worms per field) is twice the lethal dose for normal rats. In this group the eosinophiles rose as high as 16% on the thirtieth day after the first infestation. The average number of larvae found in the muscles of rats killed some 60 days after infestation was one-twentieth to one-half worm per field. This was very low, considering the large numbeer of worms experimentally administered.

In Group Four, intraperitoneal injections of 0.5 cc. and one cc. of Coca's suspension of trichina powder were no safeguard against

[1] McCoy, O. R., *Am. J. Hyg.*, 1931, **14**, 484.

lethal doses of infested meat.[2] All rats showed severe symptoms and died before the seventh day of the experiment.

In all the infested rats that survived the infestation, there was a marked increase in eosinophiles and a rapid rise in neutrophiles during the intestinal stage of the parasites.

Our observations record that the only protection given to rats for a limited period of time against infestations of *Trichinella spiralis* was the feeding of small and gradually increased doses of trichinous meat.[3] Attempts to protect rats by feeding anti- and convalescent serums, trichina powder, and by injecting intraperitoneally Coca's suspension of the dried and finely ground larvae failed to give any protection.

8915 C

Plant Extracts in the Nutrition of Guinea Pigs and Rabbits.*

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It has been known for years[1] that rabbits develop paralysis and soon die when they are restricted to rations of the concentrates commonly employed in livestock feeding. If, however, these rations are supplemented with good quality forage such as alfalfa hay they become entirely adequate. Our first basal ration, No. 800, simulated in composition a similar ration which contains 10% of alfalfa meal, and which had proved adequate for growth. It has the following composition:

Ground oats	53.1	Casein	0.25
Whole milk powder	34.2	Corn starch	0.43
Cod liver oil	1.8	Lard	0.04
Sodium chloride	0.9	Cellulose	0.14
		Salts	0.14

A long series of feedstuffs other than forages was studied in an

[2] Lucker, J. T., *J. Parasit.*, 1932, **19**, 243.

[3] Ducas, R., 1921, L'Immunité dans La Trichinose. Thése, Paris (Jouve et Cie), Pp. 47.

* Contribution from the Departments of Animal Husbandry and Agricultural Chemistry of the Missouri Agricultural Experiment Station. Journal Series No. 477.

[1] Hogan A. G., and Ritchie, W. S., *Mo. Agr. Exp. Sta. Res. Bul.*, 1934, No. 219.