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Insusceptibility of the Albino Rat to Experimental Amyloidosis.

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Amyloid has been produced experimentally in white mice by various workers, among whom are Kuczynski,[1] Letterer,[2] Smetana,[3] and Jaffé.[4] Nutrose (sodium caseinate) was injected daily. Smetana also used a cheese diet. Lucke and Markeley[5] have shown the difference of susceptibility to amyloid in rats and mice. They were unable to produce amyloid in rats by the injection of casein, but produced it in 75% of the mice.

The present study is upon the susceptibility of adrenalectomized rats to amyloid production. The rats were injected daily with 3 cc. of a 3% nutrose solution. The cheese diet used consisted of American cheese with a small amount of bread or whole wheat. When not fed on the cheese the rats were given a maintenance diet: 1/6 milk powder, 5/6 whole wheat, and salt in a quantity of 2% of the wheat.

A series of mice was also used. The mice were injected daily

TABLE 1.—Rat Series.

No.	Operation	Days experiment begun after operation	No. Nutrose injections	No. days on cheese	Amyloid
1*	Left adrenalectomy	13	214	150	—
2	" "	13	12	none	—
3*	Double adrenalectomy	13	207	144	—
4	" "	13	2	none	—
5*	Left adrenalectomy	29	47	108	—
6*	" "	29	76	138	—
7	Double adrenalectomy	29	none	6	—
8	" "	29	none	6	—
9	None		231	168	—
10	"		225	162	—
11*	"		57	119	—
12*	"		65	127	—

*Infected.

[1] Kuczniski, M. H., *Virchow's Arch.*, 1922, ccxxxix, 185.

[2] Letterer, E., *Beitrage zur path. anat. u. z. allg. Path.*, 1926, lccv, 486.

[3] Smetana, H., *Johns Hopkins Hosp. Bull.*, 1925, xxxvii, 383.

[4] Jaffé, R. H., *Arch. Path. and Lab. Med.*, 1926, i, 25.

[5] Lucke, B., and Markeley, L. A., PROC. SOC. EXP. BIOL. AND MED., 1928, xxv, 642.

with 0.5 cc. of a 5% solution of nutrose. Other mice were fed on a diet of American cheese to which a small amount of bread was added. They were given water. The injected and control mice were fed on cracked corn, lettuce, carrots, and bread. They were not given water. Further facts on the 2 series are brought out in Tables I, II and III.

There are included in Table I, 4 unoperated rats that received injections and were fed on the cheese. In 4 rats (1, 5, 11, and 12) Congo red was injected into the heart and the rats killed one hour later. This was done to discover beginning amyloidosis. The liver, spleen, and kidney were examined in all rats, and other organs in several. The tissues were stained with methyl violet, Mayer's method, I-reaction, and hematoxylin and eosin. A gradual loss of weight occurred in all rats. In 6 rats there was marked infection for many days. In 2 livers there was focal necrosis illustrating the effect of the infection. In none of these animals did amyloidosis occur.

TABLE II.—White mice. Nutrose injections.

No.	Remarks	No. of injections	Amyloid
1	Killed	31	—
2	Died	41	+
3	"	62	—
4	"	64	—
5	"	65	—
6	"	67	+
7	"	74	+
8	"	74	+
9	"	74	—
10	"	75	—
11	"	80	+
12	"	98	+
13	Killed	101	—
14	"	101	—
15	"	101	+

TABLE III.—White mice. Cheese Diet.

No.	Remarks	Duration in days	Amyloid
1	Died	20	—
2	"	29	—
3	"	34	—
4	"	42	—
5	"	48	—
6	Killed	90	—
7	"	90	—
8	"	90	—
9	"	102	—
10	"	102	—
11	"	102	—

As controls 5 mice were kept for 90 days and 4 mice for 102 days. No amyloid was found in liver, spleen, or kidney.

The mice reported in Tables II and III were examined for amyloid in liver, spleen, and kidney. The organs were stained with hematoxylin and eosin, and with methyl violet. Contrary to other workers no amyloid was found in the mice on the cheese diet. In the mice injected with nutrose amyloid was found in 46.6% of the cases.

These experiments illustrate the resistance of the white rat to amyloid production. Although nutrose injections produced amyloid in 46.6% of mice; it was ineffective in adrenalectomized rats, both double and single, and even in those rats where the factor of infection was added.

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A Method for Staining Unfixed Brain Tissue With Silver.

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In attempting to find an agent that will stain fresh brain tissue, various dyes were tried out. Those which are ordinarily employed in routine staining were first experimented with, as methylene blue, eosin, cresylviolet, janus green, neutral red, gentian violet, alum hematoxylin, etc., as well as black writing ink. None of these gave the clearly defined outlines which were desired, and all gave almost no staining of nerve cell processes. Metal impregnations were next experimented with, in which the reagents used with fixed tissue were employed. Both gold and silver were tried out on fresh tissue following the prescribed technical staining formulae for fixed material, but without success. The nearest to desired results among these was obtained by putting a very small fragment of brain cortex in a weak solution of silver nitrate, followed by washing in photograph developer solution. Even this method proved inadequate. In looking for something further to use a bottle of argyrol was happened upon, and this was tried only as a matter of curiosity. The result was so much better than that obtained in any other way, that it seems of sufficient interest to present to others wishing to pursue similar means of study.

Microphotographs are presented showing high power appear-