24 days. The pseudopregnant condition in the cat has previously been studied in great detail.[11, 12] When it is produced entirely by hormone injections,[11] the length of the period is 40-44 days. On the other hand, pseudopregnancy as the result of a sterile mating is said to end in 33 days.[12] In any case, the luteal phase, during which one may expect survival of the female from adrenal insufficiency, probably lasts about 35 days. It is likely that this figure represents the maximum survival period obtainable under these conditions.

The hormone of the corpus luteum, secreted during the luteal phase of the ovary, is capable of ameliorating the symptoms of adrenal insufficiency. This is in agreement with work on the ferret and the rat[6, 13, 14] in which it has been shown that it is possible to prevent the symptoms of adrenal insufficiency by administration of the proper dosage of pure crystalline progesterone. It should be equally feasible to demonstrate the efficacy of the pure hormone in lengthening the life-span of the adrenalectomized cat.

10535

Negative Effect of Gastric Juice Administered Intravenously to Patients with Pernicious Anemia.

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Evidence has been produced[1] to show that the site of interaction between intrinsic (gastric) factor and extrinsic (food) factor is in the intestinal tract and not parenterally. It is also true that concentrated gastric juice when administered intramuscularly will produce a hematologic response in a patient with pernicious anemia.[2] It appears from the nature of the response that the stimulus is specific and that concentrated gastric juice does contain a hematopoietic principle

11 Foster, M. A., and Hisaw, F. L., *Anat. Rec.*, 1935, **62**, 75.

12 Gros, G., *C. R. Soc. de Biol.*, 1935, **118**, 1575.

13 Greene, R. R., Wells, J. A., and Ivy, A. C., PROC. SOC. EXP. BIOL. AND MED., 1939, **40**, 83.

14 Fischer, A., and Engle, M., *Lancet*, 1939, **236**, Feb. 11, 354.

1 Castle, W. B., Heath, C. W., Strauss, M. B., and Heinle, R. W., *Am. J. Med. Sci.*, 1937, **194**, 618.

2 Morris, R. S., Schiff, L., Burger, G., and Sherman, J. E., *Am. J. Med. Sci.*, 1932, **184**, 778.

effective in pernicious anemia when administered intramuscularly.

If the interaction between the intrinsic and extrinsic factors can take place parenterally, and if the intrinsic and extrinsic factors can be absorbed as such from the intestinal tract in the normal individual, it would seem possible that administration of normal gastric juice intravenously to a patient with pernicious anemia might be capable of producing a hematologic response. This experiment, therefore, was performed on 2 patients.

The gastric juice was obtained from a normal, healthy individual in a fasting state after administration of 0.5 mg of histamine. The gastric juice was immediately neutralized with 5% sodium hydroxide and passed through a Berkefeld V filter. This latter procedure does not decrease the effectiveness of the gastric juice.[3] It was stored in an icebox until used but no gastric juice older than 4 days was employed.

Patient one received intravenously, over a period of 6 days, 190 cc of this whole, neutralized gastric juice which had been passed through a Berkefeld V filter. His diet contained 70 g of protein daily. There was no reticulocyte response in 10 days and no increase in red blood corpuscles or hemoglobin. There was subsequently a good response to liver extract* given intramuscularly (Table I).

Patient two received intravenously, over a period of 6 days, 175 cc of whole, neutralized gastric juice which had been passed through a Berkefeld V filter. His diet contained 150 g of protein daily. There was no reticulocyte response in 10 days and no increase in red blood corpuscles or hemoglobin. Subsequently, there was a good response to liver extract* administered intramuscularly (Table I).

Negative results with whole, neutralized gastric juice which had been passed through a Berkefeld V filter and administered intravenously to patients with pernicious anemia indicate either: (a) That there is no extrinsic factor as such present in the blood stream or in other parenteral sites to enable a reaction to take place; or (b) that the environment is not suitable for such a reaction; or (c) that insufficient quantities of intrinsic factor were introduced. Taylor, *et al.*,[3] have shown that the optimum pH for interaction between intrinsic and extrinsic factor is between pH 7.0 and 8.0 so that the pH of most of the parenteral tissues would constitute a favorable environment. Also, it is known[4] that liver extract, when injected parenterally, is 50

* Solution Liver Extract, Concentrated, Lilly, 2 units per cc.

3 Taylor, F. H. L., Castle, W. B., Heinle, R. W., and Adams, M. A., *J. Clin. Invest.*, 1938, **17**, 335.

4 Strauss, M. B., Taylor, F. H. L., and Castle, W. B., *J. Am. Med. Assn.*, 1931, **97**, 313.

TABLE I.
Negative Effect of Gastric Juice Administered Intravenously.

	Patient 1				Patient 2			
Day	RBC	Hgb* %	Retic. %	Therapy	RBC	Hgb* %	Retic. %	Therapy
				cc gastric juice intravenously				cc gastric juice intravenously
0	1.60	38	1.8	25	1.61	43	0.8	25
1	1.62	43	1.3	50	1.95	55	0.3	30
2	—	—	—	25	1.93	47	0.7	30
3	1.62	46	0.6	30	—	—	1.2	30
4	1.54	43	0.6	30	1.54	42	1.1	30
5	1.56	40	0.4	30	1.44	41	0.8	30
6	1.52	44	0.2	—	1.58	42	0.6	—
7	1.81	45	0.2	—	1.54	40	0.8	—
8	1.55	41	0.3	—	1.57	46	0.6	—
				cc liver ext. intramusc.				cc liver ext. intramusc.
9	—	—	0.2	—	1.55	44	0.6	10
10	1.50	41	0.7	10				
1	1.78	44	0.9	5	—	—	1.2	—
2	1.82	47	1.1	5	1.68	46	1.3	—
3	1.82	48	2.5	5	1.68	45	3.8	5
4	1.72	48	13.1	5	1.89	45	8.1	5
5	—	—	—	5	1.89	48	13.6	5
6	—	—	—	5	1.67	48	12.8	5
7	—	—	—	5	2.13	57	9.4	5
8	—	—	—	5	—	—	—	5
9	—	—	—	5	2.55	62	4.2	5
10	1.70	46	0.8	5				
15	2.19	55	0.9					

*100% Hgb = 15.6 g per 100 cc.

to 60 times as effective as the same dose given orally. If the same reasoning could be applied to intrinsic factor, it would appear that enough gastric juice had been administered to these patients since 75 cc of gastric juice administered daily by mouth with beef muscle is effective in producing a response in patients with pernicious anemia.[5] Thus, the most reasonable conclusion is that there is no extrinsic factor as such present in the blood or elsewhere parenterally to provide a substrate for interaction with the intrinsic factor present in the gastric juice administered intravenously.

The negative results obtained here also suggest that the positive effect of concentrated gastric juice injected intramuscularly[2] may be due to *in vitro* formation of a material similar to liver extract or some precursor of liver extract and not to intrinsic factor alone.

Conclusion. Normal, whole, neutralized gastric juice which had

[5] Castle, W. B., and Townsend, W. C., *Am. J. Med. Sci.*, 1929, **178**, 764.

been passed through a Berkefeld V filter and administered intravenously to patients with pernicious anemia does not produce a hematologic response probably because there is no extrinsic factor as such in the parenteral tissues to provide a substrate for interaction.

10536 P

A Pneumonia Virus of Swiss Mice.

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A virus capable of inducing fatal pneumonia in Swiss mice has been isolated from normal mouse lungs, and its immunological characteristics are now being studied in detail.

Twenty-one groups of normal Swiss mice were inoculated intranasally under ether anesthesia with 0.05 cc of lung-suspensions from uninoculated mice. Serial mouse-passage was carried on with each group, using 10% to 30% lung-suspensions. Passages were made at an average interval of 7 days; usually 6 mice were used in each group. The mice were obtained from 6 different breeders. Initially, passages were made without regard to the breeder from whom the mice had been obtained. Lately, however, passages have been made in mice from each individual breeder in order to determine the source of the virus. Definite areas of pulmonary consolidation were present in 43% of the groups in the third serial passage, and in 52% of the groups at the sixth passage. Death occurred as early as the fourth passage, and by the sixth passage deaths were recorded in 24% of the groups. Cultures of the mouse-lung suspensions were made routinely and were sterile in a great majority of instances. Rabbits were injected intraäbdominally with virus-containing material from various passages. They were bled before injection and again 8 to 10 days afterwards. Their serum was tested for the presence of antibodies capable of neutralizing the various strains of virus in the manner described by Magill and Francis.[1]

Fatal pneumonia was caused by 0.05 cc of a 10^{-3} to 10^{-4} dilution of infected mouse lung, and definite pulmonary consolidation was pro-

[1] Magill, T. P., and Francis, T., Jr., PROC. SOC. EXP. BIOL. AND MED., 1936, **35**, 463.