viable tissues should be used. This implies that the stroma of clear, corneal transplants retains its identity as donor tissue, and is not replaced by the host within a short period. It may be that after some length of time some of the corneal cells die and are replaced by new cells derived either from the host or sister cells of the transplant. This process would only be that which may occur in a normal cornea to maintain the ordinary structure of the corneal stroma. Mitosis is exceedingly rare in the corneal stroma, but has been observed in colchicine-treated amphibian eyes (Peters[8]). This replacement may occur slowly, in rabbit eyes, as is suggested by the behavior of a few of the grafts in which the degree of opacity became reduced after 70 days, somewhat as the opacity of a heavy bond paper is modified by a drop of oil. The cornea did not become clear throughout its thickness and the improvement does not appear to be continuing at this time.

Summary. 1. Corneas frozen in liquid nitrogen can be grafted in rabbits, but invariably become opaque. Transplants of living corneal tissue, using the same technic as in the frozen, are successful and remain clear. 2. The use of frozen tissue is no handicap in the performance of the operation. 3. The results support the hypothesis that for the production of permanently clear corneal transplants living tissue must be used. 4. The data also support the suggestion that the corneal stroma of a clear graft retains its identity as donor tissue for a long period of time.

[8] Peters, F. J., *The Cytological Effect of Colchicine on the Cornea of* Triturus viridescens *and of Sulfanilamide on* Allium cepa, thesis, 1946, Fordham University.

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Fibrinolytic Activity in Blood Serum During Pregnancy Complicated by Hypertensive Toxemias.

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The recent report by Smith and Smith[1] concerning fibrinolytic activity in the serum from pre-eclamptic and eclamptic patients and its absence in those with hypertensive disease with a superimposed pregnancy, suggests that there is a specific substance in the blood of the former groups which may be produced as a result of the toxemia. Should this prove to be true it would give a definite indication as to the direction toward which future research concerning the etiology of these conditions should be pointed and might well be utilized as a diagnostic test in certain obscure cases in which differentiation between the 2 conditions could not easily be made. In view of the fact, however, that the same activity was demonstrated in serum taken on the first day of menstruation and in post-operative patients, it seems more likely that this is a non-specific activity related to factors other than the pre-eclampsia.

In an effort to confirm this observation and to evaluate its application as a diagnostic procedure, bloods from a group of pregnant patients were tested for fibrinolysis.

Material. The patients were all attending the prenatal clinics of the Chicago Lying-in Hospital, the normal group being seen in the general clinic and the abnormal groups in the toxemia clinic. The normal patients demonstrated no signs which could be interpreted as indicating the presence of pre-eclampsia, with the exception of 2 who showed an excessive gain in weight. Those classified as

[1] Smith, O. W., and Smith, Geo. Van S., *Science*, 1945, **102**, 253.

TABLE I.
Fibrinolysis in Serum from Normal and Complicated Pregnancies.

	No. cases	Fibrinolysis—24 hr					
		0 (?)	+	++	+++	++++	+++++
Normal	32	28	2		2		
Pre-eclampsia	10		1		3	5	1
Hypertension	30	14	3	9	4		
Abruptio placenta	2			2			
Thrombocytopenic purpura—pregnant	1				1		
Chronic glomerulo-nephritis—not pregnant	1		1				
Nephrosis—not pregnant	1				1		
1st day menstruation	18	2			8	6	2

having hypertensive disease had all had elevated blood pressures throughout the present pregnancy and in some instances had had previous hypertensive pregnancies in this clinic. Those diagnosed as pre-eclampsia had an onset of the classical signs of this condition appearing late in pregnancy without demonstrable residual upon post-partum examination. The bloods taken on the first menstrual day were from normal young women employed in various capacities in the hospital.

Method. To 0.8 cc of the fresh test serum in a 13 mm tube, 0.2 cc of normal plasma of proven clotting ability was added. After a stable clot had formed, the tube was incubated at 37°C for 2 hours, at which time the amount of dissolution of the clot was noted and 12 Upjohn units of thrombin were added; another reading of dissolution was made at the end of 24 hours. In the early cases various dilutions of test serum were used, but when it became evident that this procedure only demonstrated less fibrinolytic activity as the amount was diminished, only the one dilution was set up. The amount of clot destruction was graded from + to +++++, in which the latter indicated complete disappearance of clot and the former only a slight increase in fluid content in the tube.

Results (Table I). *Normal patients.* Of the 32 normal patients, all formed a firm initial clot which at the end of 2 hours showed no dissolution in 26 instances. In the remaining 6 there was questionable dissolution in 5 instances and ++ in one. One of these clotted completely with the addition of thrombin and showed no further dissolution in 24 hours, while of the other 5 none formed additional clot when thrombin was added; 2 showed +++, 2 +, and one questionable clot disintegration in 24 hours. Both patients with +++ dissolution had had an excessive gain in weight at the visit on which blood was drawn.

Pre-eclampsia patients. The bloods from all 10 patients with pre-eclampsia had definite fibrinolytic activity; one +, 3 +++, 5 ++++, and one complete dissolution. The patient showing a + reaction had a very mild toxemia, while the remainder had definite well developed pre-eclampsia which in one instance was classified as severe. No eclamptics were studied.

Hypertension. Of 30 patients with chronic vascular renal disease complicating pregnancy, 12 showed no clot dissolution and 2 a questionable change. In the remaining 16, 3 had +, 9 had ++, and 4 had +++ clot destruction. Dissolution was much less pronounced than in the pre-eclamptic series; however, 15 of those in which clot destruction was noted were similar to the pre-eclamptics in that they showed proteinuria and in 8 instances edema. The total amount of protein excreted in the 24 hours during which the blood was drawn varied from 0.2 to 1.8 g and the edema from plus 1 to plus 2. The degree of lysis was apparently not related to the amount of protein excreted, however, since the urine of the patients with +++ dissolution contained the smallest amount of protein. One patient without proteinuria or edema showed a ++ reaction, 2 showed

questionable reactions, and the remainder no clot destruction.

Menstruation. Of 18 bloods drawn on the first day of seemingly normal menstruation, 2 showed no lysis, 8 +++, 6 ++++, and 2 dissolved completely.

Miscellaneous. Two patients with abruptio placenta showed ++ lysis, one non-pregnant patient with chronic glomerulonephritis showed +, one child with nephrosis +++, and one pregnant patient with thrombocytopenic purpura +++.

Discussion. The results of the study of this group of patients indicate that fibrinolytic activity is absent in the normally pregnant patient but may be present when certain complications arise. That this ability to destroy clot is not associated with any specific complication is suggested by the fact that it was present in association with a variety of conditions. The fact that fibrinolysis could be demonstrated only in those patients in whom chronic vascular renal disease was associated with proteinuria and edema suggests that this condition closely resembles preeclampsia, in which fibrinolysis is uniformly present. In view of these findings it becomes evident that this test cannot be utilized as a means of accurately differentiating between vascular renal disease and the specific pregnancy toxemias.

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Effect of Minerals on Susceptibility of Swiss Mice to Theiler's Virus.*

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The more recent developments in our knowledge of nutrition have made it possible with some species of animals to use diets composed only of highly purified components. As a result it has been possible to study the role of certain specific nutritional factors in susceptibility to infectious diseases. Previous reports from this laboratory[1-3] have concerned the effect of vitamin deficiencies on the resistance of mice and monkeys to experimental poliomyelitis. The general biological importance of calcium, phosphorus, sodium, potassium and other minerals led us to undertake the following experiments on the effect of single deficiencies of these minerals on the susceptibility of Swiss mice to Theiler's GDVII virus.

Methods. The complete synthetic diet was composed of the following parts per 100: sucrose 73, vitamin-free casein 18, salts IV 4, and corn oil 5. The vitamin supplements per 100 g of diet were: thiamine 0.3 mg, riboflavin 0.3 mg, pyridoxine 0.3 mg, niacin 0.5 mg, calcium pantothenate 2.0 mg, *i*-inositol 100 mg, choline 300 mg, *p*-amino benzoic acid 100 mg and biotin 5 μg. The several mineral-deficient diets were produced by supplying the corresponding salt mixture from Table I instead of salts IV at the percentage indicated in that table. The phosphorus-low diet was produced by replacing the casein with blood fibrin and by giving the phosphorus-free salt mixture. All of the mice received distilled water and an adequate amount of oleum percomorphum *per os* each week.

Twenty-one- to 24-day-old Swiss† mice

* These studies were aided by a grant from The National Foundation for Infantile Paralysis, Inc.

1 Rasmussen, A. F., Jr., Waisman, H. A., Elvehjem, C. A., and Clark, P. F., *J. Infect. Dis.*, 1944, **74**, 41.

2 Lichstein, H. C., McCall, K. B., Elvehjem, C. A., and Clark, P. F., *J. Bact.*, in press.

3 Lichstein, H. C., Waisman, H. A., McCall, K. B., Elvehjem, C. A., and Clark, P. F., PROC. SOC. EXP. BIOL. AND MED., 1945, **60**, 279.