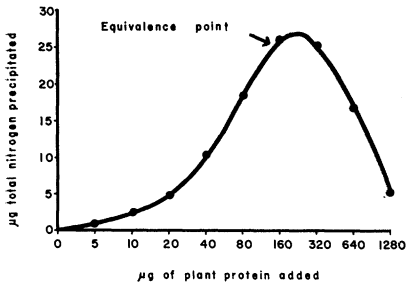

Fig. 1. Amount of nitrogen precipitated in a precipitating system consisting of an alcohol-fractionated-globulin preparation from rabbit antisera and increasingly large quantities of the crude plant protein antigen.

indicates that nonspecific precipitation reactions are absent.

This elimination of the nonspecific precipitation reaction by leaf proteins should make it possible to investigate more adequately by immunochemical methods the proteins from higher plants; such studies, as they relate to pathological conditions, are being continued (*6*).

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References and Notes

1. T. Webb *et al., Can. J. Biochem. and Physiol.* 35, 63 (1957).
2. Grateful acknowledgment is extended to Dr. Dorothy Buchanan-Davidson for advice and assistance in the immunochemical techniques and to Donald E. Slagel for making the ammonium sulfate fractionations.
3. F. E. Kendall, *J. Clin. Invest.* 16, 921 (1937).
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5. W. W. Umbreit, R. H. Burris, J. F. Stauffer, *Manometric Techniques and Tissue Metabolism* (Burgess, Minneapolis, 1949), p. 161.
6. This report is published with the approval of the director of the Wisconsin Agricultural Experiment Station. The study was supported by grants from the Herman Frasch Foundation and the Research Committee of the Graduate School, University of Wisconsin.
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Renal Lesions Produced by Group A, Type 12, Streptococci

Group A, types 12, 36, and 3, and group C streptococci (*1*) were grown in Todd-Hewitt broth for 24 hours; each resulting broth culture was inoculated through a glass side arm into a diffusion chamber, and the end of the side arm was sealed in a flame (Fig. 1). The chamber is a modification of the one described by Eschenbrenner and Francis (*2*).

The chambers were fabricated from sheet Plexiglas 3 mm thick. The rectangular pieces with rounded corners measured 20 by 28 mm, and the center hole had a diameter of 12 mm. A hole 1 mm in diameter was drilled in one end, and a 10-mm length of hot capillary tubing was inserted. Membranes of dense porosity (*3*) were glued to each side of the center hole with chloroform-Plexiglas cement. This cement was also used to seal the junction between the glass tubing and the chamber.

Uninoculated and streptococci-containing chambers were placed intraperitoneally in 8-month-old CFW female mice.

It was noted that uninoculated chambers and those containing sterile Todd-Hewitt broth remained in mice for 3 months without evoking renal lesions.

Chambers inoculated with type 12 (nephritogenic) streptococci were implanted intraperitoneally in mice and removed after 24, 48, and 72 hours, respectively. Seven days later the kidneys were removed and the contents of the chamber was cultured to check for contamination. No organisms other than streptococci were found. These kidneys showed proximal tubule necrosis and desquamation of the lining epithelium, moderate thickening of basement membranes, and adhesions between the glomerular tuft and the capsule, with debris and red blood cells in the capsular space. Minimal proliferation of cells of the glomerular tufts was noted (Figs. 2 and 3).

Type 12 (non-nephritogenic) streptococci were implanted as described above, and the chambers and kidneys were removed after the same intervals as in the previous experiments. No evidence of renal lesions was present. To further confirm this, mice were allowed to remain alive for 30 days. At the end of the period no abnormalities were noted in the kidneys.

Type 3 and group C streptococci were used in the above manner without producing renal lesions within 30 days. Isolation of the contents of the chamber revealed pure cultures in each case.

Type 36 streptococci were inoculated into chambers, but leak was purposely made to determine the effect of this type on the mice. Death occurred in 3 to 5 days, with generalized bacteremia; organisms identified as streptococci were isolated from the peritoneal cavity, the blood, and the kidneys. The kidneys were characterized by microabscesses and the picture of acute pyelonephritis. It is interesting to note that implantation of properly sealed chambers bearing type 36 streptococci produced no renal lesions within 1 month.

A streptococcal extract (*4*), prepared after the method of Pappenheimer, when placed in chambers according to the previously described procedure, produced no lesions in the kidneys.

In summary, renal lesions were found in mice bearing diffusion chambers containing nephritogenic type 12 streptococci but not in mice bearing diffusion chambers containing non-nephritogenic type 12 streptococci.

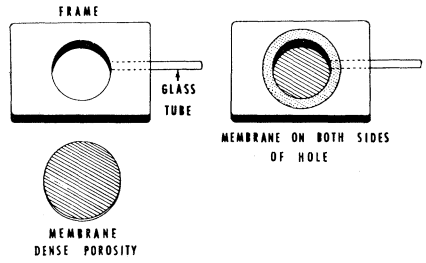

Fig. 1. Modification of chamber described by A. B. Eschenbrenner and R. D. Francis.

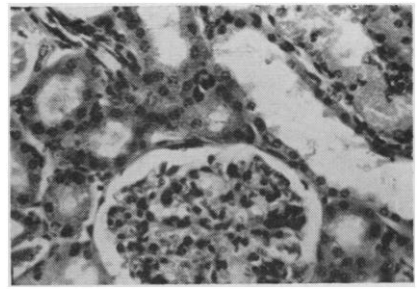

Fig. 2. Photomicrograph of mouse kidney immediately after exposure to type 12 streptococci, in chamber, for 5 days (hematoxylin and eosin stain). (About × 400)

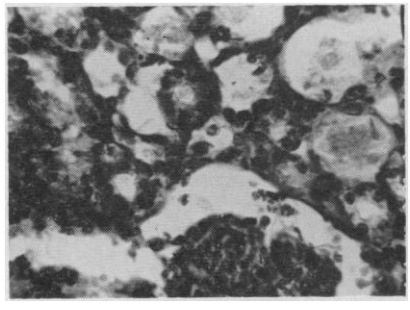

Fig. 3. Photomicrograph of mouse kidney exposed to type 12 streptococci, in chamber, for 48 hours. Kidneys removed 7 days later (hematoxylin and eosin stain). (About × 400)

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References and Notes

1. The following cultures used in this study were furnished by Elaine L. Updyke, Streptococcal Laboratory, Communicable Disease Center, Atlanta, Ga.: Type 12 (nephritogenic) strain DSB-893 isolated from an outbreak of nephritis; type 12 (non-nephritogenic) strain GS-208-4, not known to be associated with nephritis; type 3 strain GS-210-4; type 36 strain SS-269; and type C strain GS-229-4.
2. A. B. Eschenbrenner and R. D. Francis, *Federation Proc.* 15, 514 (1956).
3. The membranes were procured from Schleicher and Schuell Co., Keene, N.H.
4. This extract was prepared from type 12 streptococci, strain DSB-893, by Joseph Schubert, Communicable Disease Center, Atlanta, Ga.

27 January 1958