ages one week. Pulmonary involvement is often extensive, but the animals rarely die. On section the lungs of infected cotton rats show an alveolar exudate rich in polymorphonuclear neutrophiles. Bronchitis is frequently observed. The picture suggests a bronchopneumonia caused by bacteria, but cultures have regularly failed to reveal significant microorganisms. Moreover, the agent is transmissible after filtration through a Berkefeld V candle, as in the guinea pig.

Selected cotton rat strains have been carried through 12 to 19 passages, employing a total of 334 animals. In 47 control cotton rats no pulmonary lesions have been observed, following the intranasal inoculation and subsequent passage of normal lung suspensions.

The cotton rat strains have been shown to be antigenically similar to one another by cross-protection tests. Furthermore, recovered cotton rats are immune to reinoculation with homologous and heterologous strains of the guinea pig agent, thus demonstrating that the agents in the cotton rat are identical with the original guinea pig strains.

Neutralization and complement fixation tests with the cotton rat strains, employing sera from patients, convalescent rats, convalescent guinea pigs and immunized rabbits, have given inconclusive results.

However, both guinea pigs and cotton rats repeatedly injected by the intranasal route with human material, including sputum, throat washings, lung and spleen, develop a partial or complete immunity to infection with passage strains of the agent from either the guinea pig or the cotton rat.

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LOSS OF PROPRIOCEPTIVE REFLEXES FOLLOWING RETROGRADE DEGENERATION[1]

ACHESON, Lee and Morrison[2] have reported a decrease in spontaneous respiratory activity in the cut phrenic nerve during the period of retrograde degeneration. To check the nature of this deficiency and to define it in terms of spinal reflexes a study was made of a series of cats in which the sciatic nerve had been cut. Stimuli were delivered as single shocks to the peripheral nerves or to the dorsal roots, and recordings were made from the dorsal and ventral roots with a cathode ray oscillograph.

FIG. 1. Potentials recorded from 7th lumbar ventral root in a cat which had had the right sciatic nerve cut 12 days previously. The stimulus was in each case a single condensor discharge to the dorsal root. (*a*) Left side. (*b*) Right side. Time intervals, 1 millisecond.

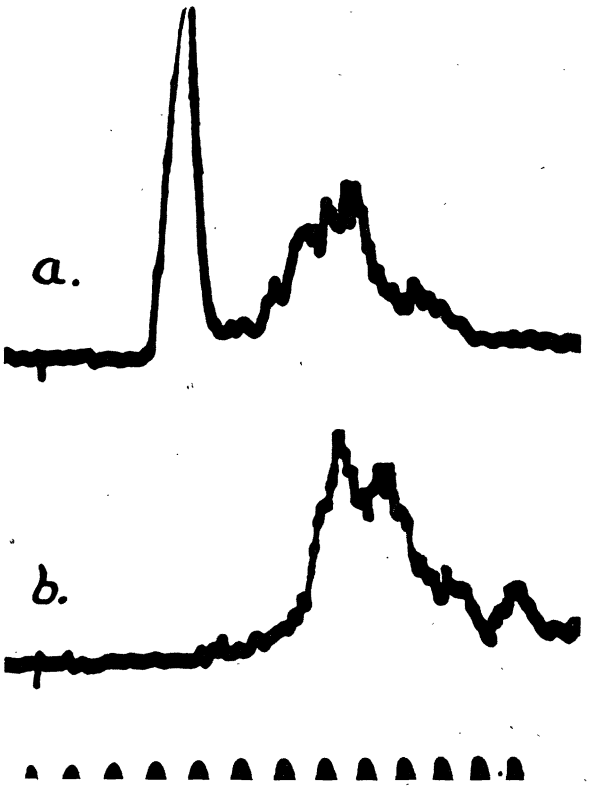

FIG. 2. Potentials recorded from seventh ventral root of same preparation in response to stimulation of the central ends of the cut sciatic nerves. The conduction distances on the two sides were approximately equal. (*a*) Left side. (*b*) Right side. Time intervals, 1 millisecond.

[1] From the Department of Neurology, College of Physicians and Surgeons, Columbia University. Aided by a grant from the National Foundation for Infantile Paralysis.

[2] G. H. Acheson, E. S. Lee and R. S. Morrison, *Jour. Neurophysiol.*, 5: 269, 1942.

Records of the dorsal-ventral root reflexes allow differentiation of the proprioceptive or myotatic reflexes (the 2 neuron reflex of Renshaw,[3] and Lloyd,[4]) and the flexor or cutaneous reflex. Fig. 1*a* illustrates the normal record from the 7th lumbar ventral root, following stimulation of the corresponding dorsal root, of these reflexes on the control side of a cat in which the peroneal, tibial and hamstring nerves had been unilaterally sectioned 12 days previously. The high initial spike represents the proprioceptive reflex, the slower later activity the flexor response. Fig. 1*b* illustrates the alteration found on the degenerated side. Note the small proprioceptive component which must be ascribed to the activity of the undegenerated nuclei of the gluteal and other hip muscles. Fig. 2*a* shows the response in the 7th lumbar ventral root of the same preparation following stimulation of the normal sciatic nerve at the level of the greater trochanter. The separation of the proprioceptive and the flexor reflexes is well marked. On the degenerated side, when the sciatic nerve was stimulated at a comparable level, the proprioceptive reflex was absent, though the flexor response was essentially unaltered. Histological check revealed extensive chromatolysis of ventral horn cells had followed the nerve section.

This effect has been found in all cats allowed to degenerate after section of the sciatic nerve over a period of from 10 to 27 days. Records were made on the 10th, 11th, 12th, 14th, 18th, 20th and 27th postoperative days. Further studies are in progress to determine the early time course of the phenomenon and to resolve the mechanism by which the deficiency is related to chromatolysis.

Summary. Section of peripheral nerves in cats leads to the loss of the ventral root potentials homologous with the proprioceptive reflex during the period of retrograde degeneration. The corresponding potentials of the flexor reflex are essentially unchanged.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

AN IMPROVED INSTRUMENT FOR MEASURING CAPILLARY FRAGILITY

IN a study of the effects of substances on the resistance of the capillary wall, Dalldorf's modification[1] of the Da Silva-Mello technique was used. Considerable difficulty, however, was experienced in visualizing the field and recognizing the appearance of petechia. The modification to be described here largely overcomes this difficulty.

The fragility of the vessels of the skin is determined by estimating their resistance to negative pressure. The apparatus as used by Dalldorf consists of a mercury manometer connected to a small cylinder approximately one centimeter in diameter and one and a half centimeters in length. One end is sealed with a glass window, while the open end is placed over the skin area. In order to obtain airtight contact with the skin and at the same time not exert undue pressure, a flat rim is attached to the open end. By means of rubber tubing the manometer and cylinder is attached to a vacuum pump. With the cylinder placed on the skin, the minimum decompression at which petechia are formed in one minute is taken as the end point.

Our modification (Fig. 1) consists in changing the small end of one speculum of an electric pneumatic otoscope into the shape of the lower end of the above described cylinder and using the otoscope with its lens system in place of the cylinder and the plain glass window. In order to convert the standard otoscope for use in this work, it is only necessary to modify one of the specula. This is cut off at a

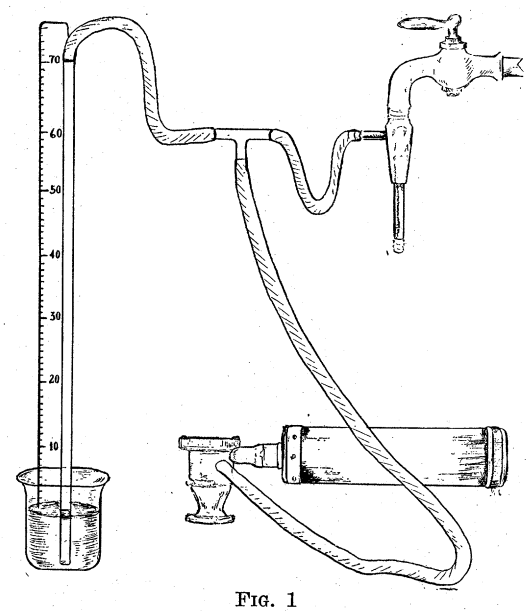

FIG. 1

point at which its diameter is approximately one cm and the small end replaced with a washer one and one half cm in diameter. When made smooth, this washer forms the surface to be applied to the skin. The tube branching from the side of the head of the otoscope is connected to the manometer and the vacuum pump by means of a piece of rubber tubing. The convex lens and small bright light make the petechia easily recognized. If a small portable

[3] B. Renshaw, *Jour. Neurophysiol.*, 3: 373, 1940.
[4] D. C. P. Lloyd, *Jour. Neurophysiol.*, 6: 111, 1943.
[1] *Jour. Exp. Med.*, 53: 289, 1931.