

Even though most of the pigs treated with sulfathiazole and sulfamethylthiazol developed typical gas gangrene and succumbed, the development of the infection was delayed and in many instances was not as extensive as those seen in the guinea pigs treated with sulfanilamide and sulfapyridine. From this, the conclusion may be drawn that sulfamethylthiazol and sulfathiazole had slight therapeutic advantage over sulfanilamide and sulfapyridine in *Clostridium welchii* infections in guinea pigs.

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Further Experiments with Deplanted and Deranged Nerve Centers in Amphibians.*

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A previous communication¹ has described the appearance of rhythmic spontaneous (=endogenous) activity, and later of reflexes, in fragments of spinal cord transplanted ("deplanted") to the dorsal fin of amphibian larvæ and provided with grafted limbs as effectors. A continuation of these studies has brought the following results.

A large section of *spinal cord* was deplanted to the fin and made to innervate 2 limbs, one grafted anteriorly and the other posteriorly. After re-innervation, prolonged seizures of spontaneous activity appeared in both limb grafts. During all major fits the beats of the 2 limbs occurred synchronously and with approximately proportional strength. This proves that in all actions, except very weak ones, the whole neurone pool of the grafted center discharges in unison. Reflexes likewise spread through the whole grafted center without localization.

Some limbs were deplanted along with their own spinal ganglia and cord segments, with all peripheral nerve connections being left intact. During the days following the operation this isolated reflex preparation gave orderly reflex responses. Gradually, however, the response deteriorated, assuming undifferentiated mass character with prolonged after-discharges, while at the same time spontaneous rhythmic

* Investigations aided by the Dr. Wallace C. and Clara A. Abbott Memorial Fund of the University of Chicago.

¹ Weiss, P., PROC. SOC. EXP. BIOL. AND MED., 1940, 44, 350.

seizures began to appear. This result demonstrates the direct relation between endogenous activity and central disorganization.

In order to intensify the structural break-down normally occurring in the deplanted centers, fragments were mutilated in various ways prior to their transplantation (slashing; sucking through pipettes too small in diameter; mincing). Such grafts behaved in the same way as undisrupted ones: spontaneous seizures and reflexes appeared within a few weeks.

Spontaneous activity has also been obtained from deplanted fragments of the spinal cord of *adult* animals; it is not, therefore, restricted to the larval stage in which the previous observations were made.

In testing dorsal and ventral cord fragments separately, it was found that both can exhibit spontaneous seizures, although more experiments will be needed to determine whether their responses are exactly alike. At any rate, the fact that dorsal gray devoid of specialized motor cells does exhibit spontaneous activity, is in itself noteworthy. Similarly, reflexes were obtained from purely ventral fragments.

Deplanted fragments of *medulla oblongata* exhibit spontaneous activity of great intensity and usually very pronounced periodicity. However, none of the 8 cases thus far observed have shown reflexes of the kind regularly obtained in spinal cord grafts.

In confirmation of earlier observations, the composition of the blood was again found to affect the discharge threshold: invariably, exercise of the host body is followed by a marked intensification of spontaneous activity and reflex sensitivity in the deplants. Whether this effect is caused by anoxemia, CO₂, acidity, or metabolites, is for the future to decide.

In conclusion, these experiments amplify previously reported results in showing that deplanted pools of central neurones from a wide variety of sources display rhythmic spontaneous activity. We may assume that the factors generating this activity and determining its pulse are present in all gray matter, but are normally prevented from reaching discharge threshold by harnessing effects lying in the organization of the intact nervous system. The appearance of the rhythmic spontaneous discharges in the deplanted fragments may therefore be ascribed to the break-down (degradation) of the finer central organization. One factor affecting the discharge threshold has definitely been identified as humoral, inasmuch as the threshold fluctuates with the composition of the blood.