variations in the extent of differentiation with respect to capacity for the production of seedling stand.

Such a method of comparison as that here suggested is desirable since it is possible that criteria of differentiation based on means and standard deviations alone may be inadequate in view of the fact that the form of the distribution may differ in the two varieties or environmental conditions compared.

This is a preliminary report.

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Decorticate Rigidity.

N. J. BERKWITZ, R. E. MORRIS, F. H. SCOTT AND J. C. McKINLEY.

From the Division of Nervous and Mental Diseases, and the Department of Physiology, University of Minnesota.

On section of the brain stem at the level of the colliculi, Sherrington[1] in 1897 observed that the animals (cats) passed into a condition of increased extensor tonus. This condition he called "decerebrate rigidity". The rigidity was "confined to those muscles which maintain the animal in erect attitude".

Goltz,[2] Holmes,[3] Rothman[4] and de Barenne[5] studied dogs in which the frontal portion of the brain was removed, and in which most of the thalamus and midbrain were left intact, but reported no rigidity. Thiele[6] and Magnus[7] have stated that it is necessary to section the brain in the mesencephalic region to obtain rigidity. Hence it has been generally accepted that the condition results, not from removal of the cerebral cortex, but from transection in the region of the midbrain, at or near a supposed rigidity center. However, we find that rigidity follows at once if a sufficient amount of the cortex alone is removed, leaving all other structures intact.

In our experiments four monkeys (Javanese macaques), and three dogs have been used. After removal of the calvarium, as much of the cortex was clipped off with scissors as could be reached without injury to other portions of the brain. The plane of removal was sufficiently superficial so that the portions of cortex surrounding the deep sulci were left intact. The areas of removal were in general as follows: dorsal, medial and lateral surfaces and the anterior tips of the frontal cortices, all of the parietal cortices, the posterior portion of the temporal lobes, and all of the occipital cortices, except that in contact with the anterior half of the tentorium. In every case a well marked generalized muscular rigidity appeared during recovery from the anesthesia, and the nervous responses retained were apparently entirely automatic.

The rigidity in the monkeys differed from that observed in the dogs. The monkeys showed flexor rigidity of the neck, trunk and extremities. But upon skin stimulation with a needle point they would frequently go into extensor rigidity and then slowly return to flexor rigidity. After several hours the upper or lower extremities frequently became flaccid, but would return to flexor or extensor rigidity on disturbing the animal. Similar observations have been recorded by Bazett and Penfield[8] in studying chronic decerebrate cats. The monkeys assumed various postural patterns as reported by Magnus in the study of decerebrate rabbits: when their heads were turned to the right their lower limbs went from flexor to extensor rigidity, the right side being more rigid than the left; and when their heads were turned to the left a similar picture was obtained but the left side showed more rigidity than the right. Unilateral decortication on one of the four monkeys resulted in homolateral rigidity with preservation of voluntary movements and contralateral paralysis with less rigidity than on the homolateral side.

The dogs went into extensor rigidity after decortication. When placed on the right side the extremities of the right side were most rigid, and when placed on the left side the extremities of the left side were most rigid. As in the case with monkeys, when the head was turned to the left, the extremities on that side became more rigid, and when the head was turned to the right the extremities on the right became more rigid. When placed in a sitting position with the limbs flexed, the animals developed flexor rigidity. This flexor rigidity persisted when the dogs were tipped from the sitting position on to their backs but the rigidity became extensor when the animals were placed again on their sides. Unilateral decortication was performed on one dog, and the same phenomena with homolateral rigidity and contralateral paralysis were observed as in the case of the monkey already mentioned. In one dog the usual mesencephalic decerebration was performed 2 hours following decortication. The rigidity became more marked but showed no definite qualitative changes. All the animals showed pupillary reflexes. They all shivered at times.

Karplus and Kreidl[9] extirpated both hemispheres of monkeys leaving the thalamus intact, and report tonic extremities in some of the animals. Olmsted and Logan[10] removed part of the motor cortex in cats and observed some extensor rigidity. They also observed extensor rigidity upon injury to the frontal lobes.

The foregoing observations demonstrate that removal of sufficient cerebral cortex results in rigidity, similar if not identical to decerebrate rigidity obtained by the usual midbrain section. It appears to us, therefore, that decerebrate rigidity may well be explained simply on the assumption of removal of cortical inhibition, rather than on the basis of special tonus mechanisms, which is sometimes postulated in the literature of this subject.

This is a preliminary report.

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