4) Approach to superior colliculus (stratum lemnisci) for congenital nystagmus.

New apparatus (IVth type) and new operation techniques devised by the authors were employed. The results obtained were gratifying with minimal risk, which will be discussed by the authors.

27. Further Clinical and Physiological Observations on Stereotaxic Surgery for Involuntary Movements

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Further observations of our stereotaxic operation for involuntary movements are reported. The stereoencephalotome which we designed has been improved. At present, the fifth model is used.

Eighty-four patients of involuntary movements have been operated during the past five years. For parkinsonism, we performed pallidotomy or pallido-capsulotomy with considerably good results, while recently we have found the most effective point of lesion for both the rigidity and tremor between the thalamus and the internal capsule, i.e. directly ventral, lateral and posterior to the ventrolateral nucleus of the thalamus, and we have called the destruction of this point thalamo-capsulotomy (T.C.), which has been performed on 13 cases with good results.

During the operative procedure, recording of the electrical activity and electrical stimulation of subcortical nuclei were made with multiple depth electrodes. Similar rhythm to α-waves was obtained from the globus pallidus. Stimulation of the thalamo-capsular region caused increased monosynaptic H-reflex as well as increased excitability of alpha motor cells of the anterior column of the spinal cord in the electromyogram of the corresponding soleus muscle, while stimulation of the globus pallidus elicits only an increase of rigidity of the corresponding muscles, without any increase of H-reflex.

Experiences with Stereotaxic Surgery, Particular Reference to the Location of Abolition of Tremor

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With the aid of image amplifier as well as roentgen control, 48 cases have
been treated by stereotaxy with excellent results, for the past one and a half years. These cases consisted of 19 cases of parkinsonian tremor, 9 of spasmodic torticollis, 6 of cerebral palsy, 3 of choreoathetosis, 1 of writing cramp, 5 of cerebellar ataxia of intention tremor and 5 of erration idiocy. In these cases the following four types of lesions were made with 0.8 cc of 3% celloidin-alcohol-Moljodol solution according to main symptoms.

1. Rigidity or rigidospasm: medial globus pallidus.
2. Choreoathetosis and spasmodic torticollis: ventrolateral thalamic nucleus, especially oral anterior ventral nucleus as well as oral internal ventral nucleus.
3. Tremor: region of zone incerta including H₁ and H₂ at the level of oral posterior ventral nucleus, which is the posterior part of the ventrolateral thalamic nucleus.
4. Erratic idiocy: anteroprincipal thalamic nucleus and dorsomedial thalamic nucleus (bilateral).

Tremor has been abolished by making lesions either in medial globus pallidus or in oral anteror ventral nucleus in approximately 60% of cases with tremor. However, if a lesion was placed in the above-mentioned location (No. 3), tremor was dramatically abolished. Since no autopsy study was made, it is impossible to compare our location with thalamo-capsulotomy reported in No. 31. In our cases, the center of the lesion was placed 1.5-3 mm behind the midcommissural point on the commissural line and 10 mm lateral to the midline. Judging from our experiences, the internal capsule seemed to have been damaged to some extent where it adjoins the oral posterior ventral thalamic nucleus at the above-mentioned level.

28. Comparative Studies on Various Destructive Methods of Cerebral Tissue

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For the purpose of evaluating the various methods of destruction to cerebral tissue which are widely used in stereotaxic surgery for involuntary movements, the author has stereotaxically destroyed the globus pallidus of cats, using electrocautery and injection of oil-wax or Etopalin. Cats were sacrificed postoperatively with certain intervals and their brains were investigated.

The activity of cholinesterase and the amount of free amino acid nitrogen were both decreased in the vicinity of the lesion. The decrease was more marked covered with the lapse of time, while the recovery could hardly be seen in cases in which electrocautery was used. The decrease of both gradually recovered