If the plateau values are assumed to be the pH of the tissue at definite CO_2 tensions and if these are compared with the hydrogen ion concentrations calculated from CO_2 combining power data,[2] the agreement is found to be good between 36 and 100 mm. Hg. CO_2 tensions. Above this range the electrometric method gives readings 0.1 to 0.2 pH higher. Below 36 mm. Hg. CO_2 tension, plateau values were not obtained in one hour.

In the presence of tank N_2 or tank O_2 the pH of resting muscle became progressively more acid at a decreasingly rapid rate. Apparently at alkaline reactions (pH 7.3 to 8.0) pure O_2 cannot prevent acid production, although the tissue reaction is maintained at a constant level in the presence of 5% CO_2 in O_2. The acid shift in the presence of O_2 could be delayed and markedly decreased although it is not absent in muscles poisoned with iodoacetic acid. The lactic acid relations of these muscles are being investigated.

In the presence of tank CO_2 the initial rapid acid shift was succeeded by a prolonged alkaline drift which is probably due to phosphagen destruction.[3]

Muscles exposed to 150 mm. Hg. CO_2 tension for 5 hours showed a more alkaline plateau than the matched muscles exposed to the same CO_2 tension for 1 hour. This is in agreement with the CO_2 dissociation data obtained in this laboratory.[2]

Up to at least 45 minutes the pH of muscles in CO_2/O_2 gas mixtures could usually be reversed to or near the original level by flushing O_2 through the chamber.

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Nuclear Configuration of Thalamus of Macacus Rhesus.

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The thalamic nuclei of the rat, armadillo, Tupaia, Carnivora, *Lemur catta,* and Cercopithecus have been identified from cell stained preparations by various authors. These studies are of interest because they form a basis for a comparative study of the thalamus, because a knowledge of the nuclei is necessary for an

[2] Root, W. S., *J. Cell. and Comp. Physiol.*, 1933, **3**, 101.

[3] Lipmann, F., and Meyerhof, O., *Biochem. Z.*, 1930, **227**, 84.

accurate study of the connections of the thalamus with other portions of the nervous system, and because a knowledge of both the nuclei and fiber connections is necessary for carrying out and interpreting experimental work on the thalamus. For these three reasons the present investigation has been made.

Five monkey brains were fixed in trichloracetic acid and stained with toluidine blue, according to the technic of Huber.[1] Two were sectioned frontally, 2 transversely, and one sagittally. The cell groupings and arrangements, their separation by fiber masses, and outstanding differences in cell types were used as criteria for designating nuclei.

The nuclei were divided into anterior, middle, midline, lateral, ventral, and posterior groups. The anterior group consists of the anteromedial, anterodorsal, and anteroventral nuclei. They resemble the 3 anterior nuclei of lower mammals, with the exception of the anterodorsal nucleus, which is markedly reduced in size. The reduction of the anterodorsal nucleus is gradual from the lower mammals to the higher.

The nuclei of the medial group are parataenialis medialis and lateralis, medialis dorsalis, medialis ventralis, parafascicularis, centre median, paracentralis, and centralis lateralis. The parataenial nuclei and the nucleus medialis ventralis are much smaller than they are in the lower mammals, while the nucleus medialis dorsalis and the centre median have increased a great deal. The other nuclei of the medial group are very similar to those of Carnivora.

The midline nuclei are interparataenialis, interanteromedialis, centralis medialis, paraventricularis anterior and posterior, and an undifferentiated area termed the central gray mass. This whole region is very small and it is not nearly so well developed as it is in Carnivora.

The lateral region is composed of the nuclei lateralis dorsalis, lateralis anteromedialis, lateralis anterolateralis, lateralis posterior, angularis, and reticularis. This region increases in both size and complexity through phylogeny. The increased number of nuclei and their different arrangement in *Macacus rhesus* make it impossible to compare them with the lateral nuclei of Carnivora and Tarsius, but they can be homologized with the lateral nuclei of *Lemur catta* and Cercopithecus.

[1] Huber, G. C., 1927. Contributions to medical science dedicated to Aldred Scott Warthin. Wohr., Ann Arbor.

The nuclei ventralis anterolateralis, anteromedialis, intermedius, posterolateralis, posteromedialis, and posteroinferior make up the ventral group. This group increases in size and complexity in phylogeny just as the lateral group does. At the present time these nuclei can be compared to only the ventral nuclei of other primates.

The pulvinar makes up most of the posterior region. It is divided into medial, lateral, and inferior nuclei, the first 2 of which can be subdivided into smaller portions. The other 2 nuclei of the posterior region are the nucleus limitans and nucleus suprageniculatus, which are homologous to the similarly named nuclei in Carnivora and in other primates. The pulvinar seems to represent the posterior nucleus, the posterior portion of the lateral nucleus, and the pretectal nucleus of lower mammals.

Homologies of the lateral, ventral, and posterior groups cannot be definitely made until the fiber connections of these nuclei are determined.

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Nuclear Configuration of Subthalamus and Hypothalamus of Macacus Rhesus.

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This work is a phase of the general program of study on the diencephalon. The same technic and method of study were used here as were described in the preceding paper.

The preoptic area is so closely associated with the hypothalamus that its nuclei were also studied. The following nuclei were identified: medial, and lateral preoptic nuclei, nucleus paraventricularis preopticus, and nucleus interstitialis pedunculi thalami. These all appear to be homologous to the nuclei of the same name described by Rioch[1] for Carnivora.

The nuclei of the hypothalamus can be arbitrarily divided into 2 main groups, the nuclei of the infundibulum, and those of the mammillary system. The infundibular group will be considered first. Lying along the floor of the infundibulum and above the chiasma are the nuclei ovoideus, tangentialis, and supraopticus difussus. The nuclei lying close to or around the hypothalamic ventricle,

[1] Rioch, D. McK., *J. Comp. Neurol.*, 1929, **49**, 1.