ACID BASE BALANCE BETWEEN CSF AND ARTERIAL BLOOD IN PATIENTS WITH A RESPIRATORY DISORDER. Chin-Tang Huang,* and Harold A. Lyons. State University of New York, Downstate Medical Center, Brooklyn, N. Y.

Using paired arterial and cerebrospinal fluid (CSF), pH, PCO_2 and HCO_3 levels, relationships were examined for 53 patients with a respiratory disorder. CSF was obtained by lumbar collection and each ventilatory state existed for days. The abnormal ventilatory states were associated with hypocarbia (17 pts.), and hypercarbia (13 pts.); and normocarbic (23 pts.). The data were separately analyzed for each, except the severe hypercarbic state ($PaCO_2$ > 65 mmHg) was determined as a third group and compared to that of normals. With abnormal arterial carbon dioxide tensions and pH, large changes of HCO_3^- in blood was accompanied by small changes in CSF. Spinal fluid pH was maintained within the normal range ($7.343 \pm .035$). However, for the grossly hypercarbic state CSF pH was lowered with large changes in HCO_3^-. In this last state the CSF-arterial gradient for PCO_2 and pH is similar to the normal but at a very different level for each. The data suggest that whatever mechanism is acting that the cerebrospinal fluid pH is maintained fairly constant within certain limits of change but beyond these limits the CSF pH can no longer be held constant.

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RESPONSES OF MONKEY GENICULATE CELLS TO MONOCHROMATIC AND WHITE SPOTS OF LIGHT. D.H.Hubel & T.N.Wiesel, Dept.Pharm.Harvard Med.School, Boston.

In a series of 12 anesthetized Rhesus monkeys we have examined the receptive fields of 223 geniculate cells in the light adapted state. In each of the four dorsal layers three main classes can be distinguished. With white light a cell of the first type resembled cat geniculate cells in having receptive fields with on-center and off-surround, or the reverse. With monochromatic light the receptive fields of these cells had two antagonistic components, an excitatory and an inhibitory, which were different not only in spatial distribution but also in spectral sensitivity. The spectral peaks of the two antagonistic components were found in the following combinations: long wavelength on-center(peak about 580mu) & middle off-surround(peak about 540mu); long off-center & middle on-periphery; middle on-center & long off-surround; middle off-center & long on-surround; short on-center (peak about 450) & middle off-surround. The second type of cell resembled the first in having two antagonistic components with different spectral sensitivities: they differed in that the spatial distributions of the two components were identical; there was no center-periphery arrangement. Peripheral suppression did not occur at any wavelength, and the interaction between the two overlapping systems did not depend on spot size. Four subtypes were found: short on/middle off, short off/middle on, middle on/long off, and middle off/long on. The peak sensitivities (450,540,580 mu) of the excitatory and inhibitory systems in color-opponent geniculate cells are consistent with the peak absorption spectra recently described for three types of cones in the Rhesus monkey. Cells of a third type were similar to on-center or off-center cat retinal ganglion cells and geniculate cells: the center and surround of their receptive fields had identical spectral sensitivity. Some had on-centers, others off-centers.