histones, reported entry of histones into sarcoma-180 cells (but not into nuclei) as estimated by fluorescence microscopy. The use of hydrolyzed histone[11] or free amino acids[10] gave a different picture with label primarily in the cytoplasm.

The reason for a different localization of the lysine-rich fraction I than the 2 arginine-rich histones is not clear without further work. It is possible that over a longer period of time, fraction I might also have entered the nucleus. On the other hand, there might be a permeability barrier of the nuclear membrane to fraction I, but not to fractions II and III. This would agree with the idea that lysine-rich histone is synthesized in the nucleus[12] but arginine-rich histones are synthesized in the cytoplasm and must then enter the nucleus[13].

The fact that histones, both native and foreign, are able to penetrate various cell types, even to the nucleus, should be useful in further studies of histone functions in vivo, as well as in studies of permeability. It might be possible, not only to localize various histone fractions more specifically, but also to use added histone fractions to alter the normal histone complement of a cell[14].

Zusammenfassung. Wurzeln von *Vicia faba* nehmen ^{3}H-markierte Histon-Bruchstücke auf. Mikroautoradiographien lassen auf eine unterschiedliche intrazelluläre Lokalisation der Histon-Bruchstücke schliessen.

CLAIRE DICK[15]

Department of Physiology and Whitman Laboratory, University of Chicago, Chicago (Illinois, USA),
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[15] Present address: Chester Beatty Research Institute, Institute of Cancer Research, Royal Cancer Hospital, Fulham Road, London, S.W. 3.

Nystagmus and the Activity of Visual Cortex Cells

In the study on sleep with low voltage fast EEG activity and made with an unanaesthetized cat sleeping in a dark cage[1], it emerged that the highest discharge rate of visual cortex cells tended to commence after saccadic bursts of rapid eye movements. It was thought that during that stage of sleep, a common brain stem factor had affected both the eye muscles and the visual cortex. Regarding the corollarity of peripheral oculomotor activity and the visual cortex discharge which occurred in sleeping cats without light stimulation of the retina, a decision was made further to study this corollarity in alert monkeys by changing the input to the central oculomotor system, i.e. by using labyrinthine stimulation.

Methods. In the present work, the single unit activity of the area striata was compared with the postcaloric nystagmus pattern when light stimulation of the retina was avoided. Major attention was paid to the possible grouping of neuronal discharges in area striata and to the relationship of this grouping to the nystagmus rhythm. The experiments were carried out on monkeys (*Macaca mulatta*). During the recording session, the monkey sat in a primate chair with the head bent backward at an angle of 60° and restrained according to the method reported elsewhere[2]. The eyes were covered by opaque contact occluders after application of the local anaesthetic. The stimuli consisted of 1–2 sec of irrigation of the left external ear canal with 2 cm^3 of water at 20–23 °C, thereby provoking horizontal nystagmus with the fast phase to the right. The phasic activity of the right lateral rectus muscle corresponded, in this case, to the rapid phase of postcaloric horizontal nystagmus.

Results. Thirty-two units from striate cortex on the left side were recorded during the horizontal postcaloric nystagmus, together with the EMG of the right lateral rectus eye muscle. Occasionally the discharge rate of most visual units showed a change in relation to the nystagmic rhythm. Two main types of relation were found between visual cortex cell discharge and nystagmus, both comprising about 40% of the total material: (1) the unit discharges tended to occur in a general relationship to the fast phases of nystagmus. The highest frequency of unit activity corresponded to the ocular EMG or alternatively to the periods immediately before or after the EMG burst, including the initial and final parts of the slow phase and the momentary standstill of the eyes during the turning points of nystagmus (Figure 1). (2) The unit discharges occurred mainly during the slow phase of nystagmus, often in regular series and ceasing with the fast phases (Figure 2). In the remaining part of the material, the unit grouping deviated so much from the nystagmus rhythm that there was a continuous shifting in the temporal relation between these 2 phenomena. Sometimes the relation between visual unit discharge and the lateral eye muscle activity was of the same type, regardless of whether the ocular muscle activity contributed to nystagmus or non-nystagmic 'spontaneous' saccadic eye movements. Earlier[1] it was shown that during sleep the highest rate of visual unit discharge was found to occur after the small bursts of eye muscle activity. In the present study an analogous type of relationship was also found, but only in some cases. In general, there is no doubt in both of these studies about the contribution of visual cortex activity, but the present findings showed more variations. The reason for this difference may be as follows: (1) During sleep with low voltage fast EEG activity, the central system of the oculomotor phenomena may be more stereotyped than during postcaloric nystagmus in an alert animal. For example, in the latter case, the animal may sometimes attempt to make a voluntary eye movement during the nystagmus. (2) The visual cortex reaction to labyrinthine stimulation in 'encéphale isolé' cats has a long and variable latency[3].

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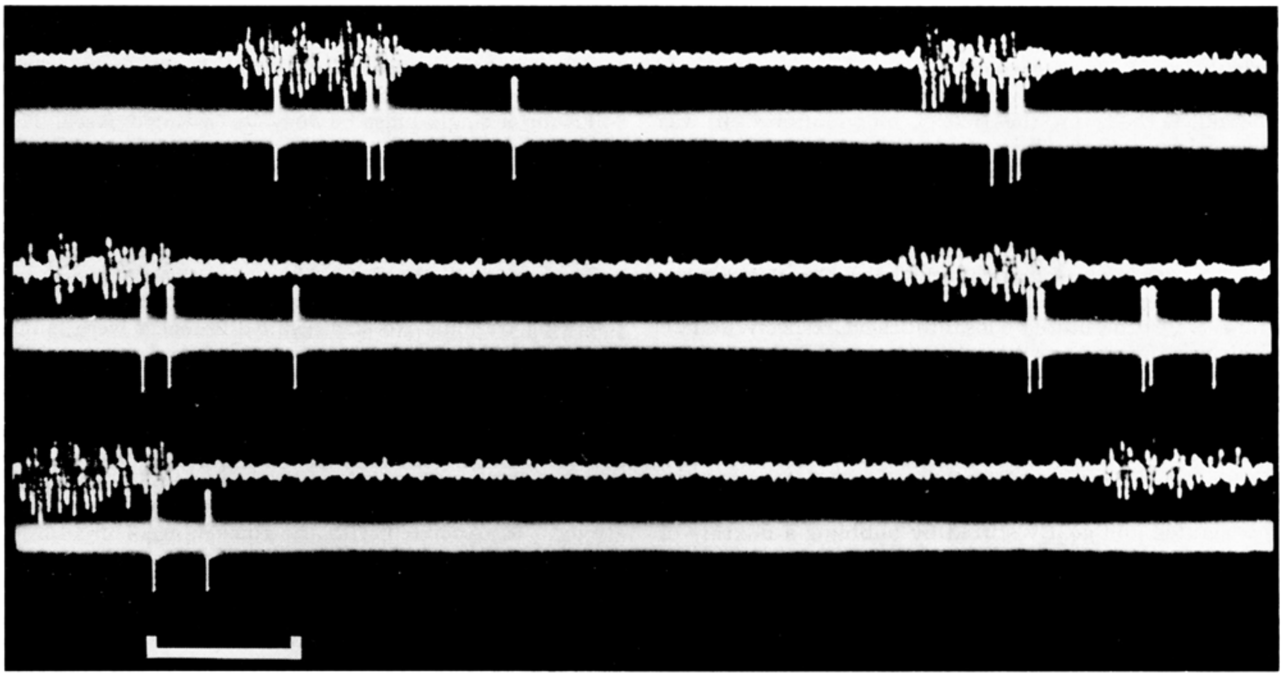

Fig. 1. Single unit recording from the left visual cortex. EMG from the right lateral rectus eye muscle. Unit discharges occur in general relation to the fast phases of nystagmus which are represented by bursts of ocular EMG. Top recordings 2 sec, middle ones 7 sec and lowest ones 15 sec after the start of the postcaloric nystagmus. Time scale 100 msec.

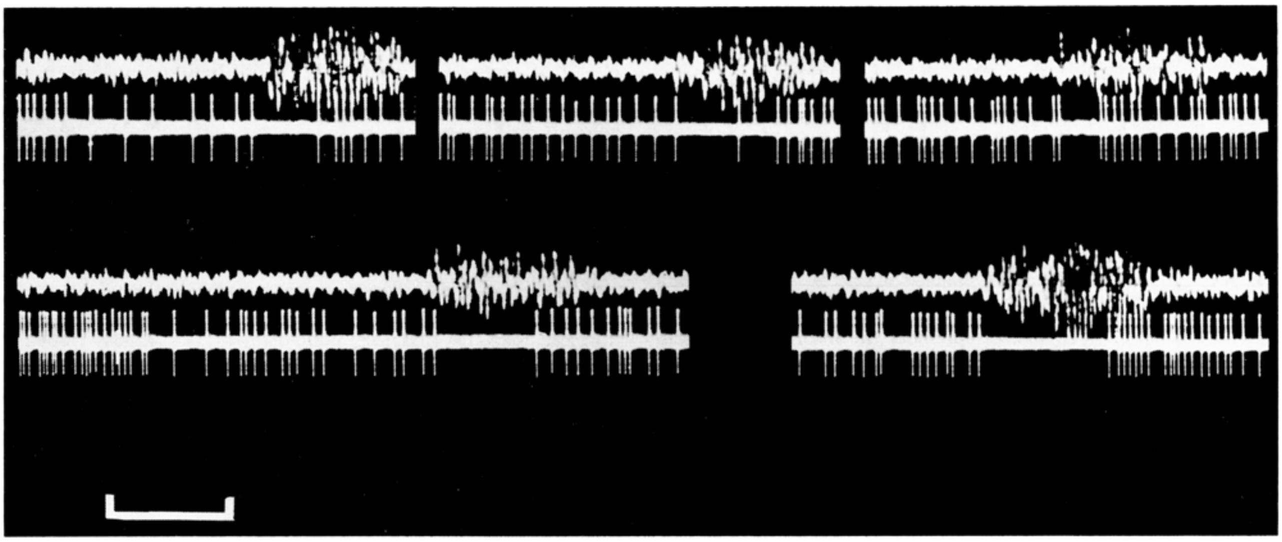

Fig. 2. Unit discharges occur mainly during the slow phases of nystagmus and tend to cease during the fast phases. Time scale 100 msec.

Such functional connections could explain the occasional shifts in the temporal relationship of visual unit grouping and the nystagmus rhythm. Furthermore, nystagmus, as a matter of fact, is a complex phenomenon consisting of a deviating system, a slow phase, and of a correcting system, a rapid phase, and both of these factors – tied together as nystagmus – may have their own implications at the visual cortex level. In the present study the imprinting of visual cortex activity during postcaloric nystagmus could be the result of the vestibular influence proper and the brain stem component common to eye movements of different backgrounds[4].

Zusammenfassung. Mikroableitungen während des postkalorischen Nystagmus von Neuronen der Area 17 des Affen ergaben Entladungsmuster der Neuronen synchron dem Nystagmusrhythmus, obwohl die Belichtung der Augen verhindert war.

P. Valleala

Department of Physiology, University of Turku (Finland), 13 November 1967.

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