Two new clotting factors described by Spaet(11) and Ratnoff(12) are not identical with factor X because they are not adsorbed on barium sulfate.

Summary. 1. A new clotting factor, factor X, participating in blood thromboplastin formation is demonstrated by matching experiments with various pathological sera. The possible influence of thrombin and factor VII is eliminated. The objection that factor X deficiency may be nothing else than a slight deficiency of factor IX is discussed. This hypothesis is in contradiction with our results. 2. Factor X is present in normal serum and in hemophilia B-Serum, absent in hepatitis-serum and in serum of Marcoumar-(Dicoumarol derivative) treated patients. The affinity of factor X to barium sulfate is greater than that of Factor VII and IX. This property is utilised for the purification of Factor X. 3. Factor X is not identical with PTA and the new factors of Spaet *et al.* and of Ratnoff *et al.*

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Response of Visual Area to Callosal Impulses in the Cat.* (21928)

FRÉDÉRIC BREMER. (Introduced by P. Bailey.)

From the Laboratory of Physiopathology, Brussels University Medical School.

There are still uncertainties concerning the collosal connections of the visual area. The anatomical(1-3) and the oscillographic data are equivocal. Reactions of the area to a synchronized volley of callosal impulses have been found in the cat by Curtis(3) and also (from his experimental map) by Garol(4). But Curtis(3), McCulloch and Garol(5), Bailey, Bonin and McCulloch(6) were unable to discover any commissural connections from area 17 in the cat, the monkey and in the chimpanzee.

In the unanesthetized cat ("encéphale isolé" préparation) callosal responses of the visual area, which can be recorded with great regularity, have revealed special features which seem of interest.

Methods. All observations have been done on adult cats after an initial ether narcosis during which the spinal cord had been cut at the C_1 level, the optic nerve prepared on one side and the cortex exposed on both sides. The callosal volley was produced by a thyratron shock of 0.5 millisecond duration applied to a point of the contralateral gyrus lateralis symmetrical to the point whose potentials were recorded. The responses of various other areas were displayed simultaneously on the second beam of the cathode ray oscilloscope. The differential amplifier systems had an overall time-constant of 0.1 sec. The cortical stimulation was bipolar, the recording of the potentials monopolar. The response of the visual area I to shocks on the contra-

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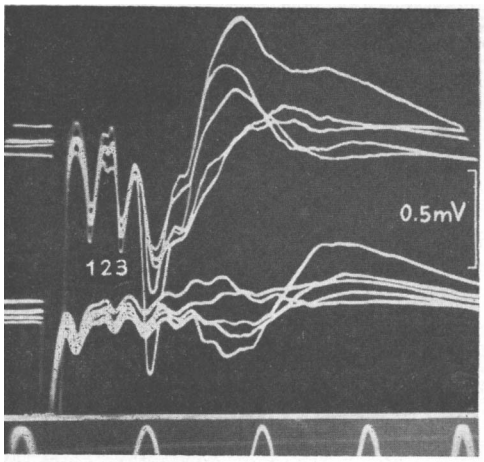

FIG. 1. A: Responses of area I (upper traces) and of suprasylvian gyrus to a shock on contralateral optic nerve (negativity upwards); 5 successive sweeps taken at 10 second intervals show lability of the slow phases of the response, contrasting with the stability of its spike-like components; time marks: 10 msec.

lateral optic nerve or to brief flashes of light were recorded for comparison.

Results. It seems opportune to recall first the characteristic pattern of the reaction of the visual area I to a volley of geniculo-cortical impulses. As described by Bartley and Bishop(7), the distinctive feature of the response is its beginning by a succession of surface-positive spike-like deflections, labeled 1, 2 and 3 in Fig. 1 (see also Figs. 2A, 3B), preceding the slower diphasic oscillation (positive-negative) which constitutes the reaction of all isocortical areas to a volley of afferent impulses (see Fig. 2B). Our own analysis has led us to endorse the conclusion of Chang and Kaada(8), but not confirmed by Bishop(9), that these initial spike-like deflections all represent radiation potentials assignable to the activities of different systems of geniculo-cortical neurones. As such these components of the response are much less labile than the following slower positive-negative complex which expresses the post-synaptic reaction of cortical neurones (Fig. 1, upper traces). This typical pattern is observed in all divisions of visual area I, with an eventual variation of amplitude of its components (Fig. 2A). Paravisual areas (Fig. 1, lower traces) show small dips in phase with the spikes of the visual area and probably representing the field effects of radiation potentials.

The recording of the response of the same visual area to a callosal volley revealed an analogous pattern to the sensory reaction just described, and quite unlike the callosal response of other cortical regions (Fig. 2C) for the acoustic area. Like the sensory response it is characterized by an initial succession of spike-like deflections preceding the slower potential and encroaching upon it. Callosal response from 3 different experiments is reproduced in Fig. 3B, C (upper trace) and D. The analogy is particularly striking between the lower trace of Fig. 2A and the upper trace of Fig. 3C because of the small amplitude of the slow components of the responses in both cases.

Except for small field effects (Fig. 3C, lower trace), the typical response is limited to the visual area. It is completely abol-

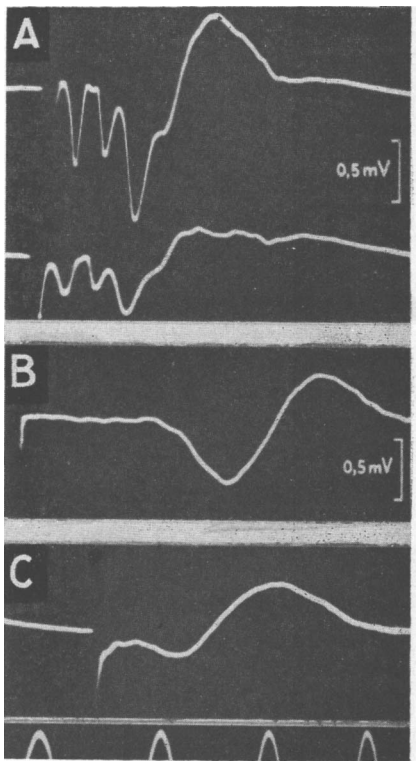

FIG. 2. A: Responses of middle portion of visual area (upper trace) and of posterior portion to optic nerve shock; B: auditory area I, response to a click; C: auditory area I, response to a shock on symmetrical point of opposite hemisphere; time: 10 msec.

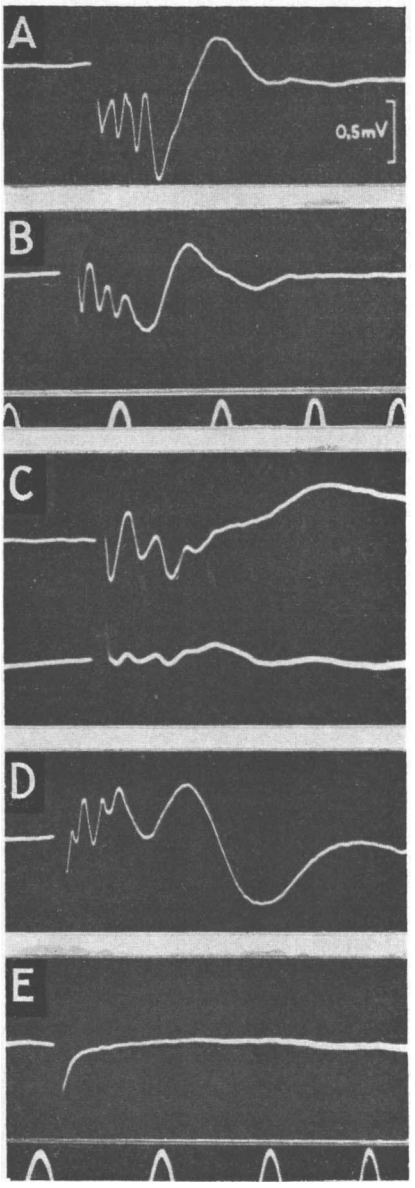

FIG. 3. A: Callosal response of visual area I; B: same cat, response of same point of visual area to optic nerve shock; C: another cat, callosal response of visual area I (upper trace) and of suprasylvian gyrus. D and E, another cat; D: callosal response of visual area I; E: complete disappearance of response after section of corpus callosum.

ished by the section of the corpus callosum (Fig. E) and it can exert on the sensory response (to an optic-nerve-shock or to a flash) following it the same facilitatory effect which has been described for the acoustic area(10,11). The precession of a callosal volley may treble the voltage of the sensory response. As for the acoustic area, the facilitatory modification is not related to any slow wave following the callosal volley and is a long lasting phenomenon, with a regular curve of decay sometimes not ended after 150 msec.

The experimental analysis which suggests that the spike-like deflections of the sensory response are fiber potentials leads to the same conclusion for the spikes of the callosal response. Like the sensory spikes they are unaffected by a local strychnization or by a narcotic depression, which strongly affect the later slower components of the response. They are picked up from the underlying white matter after excision of the visual cortex. When the stimulating shock is applied directly on the relevant callosal fibers on the midline, the spacing of the spikes is reduced, a logical consequence of the shortening of the conduction distance for impulses which are supposed dispersed on account of their different velocities(12).

Conclusions. This being so, the formal analogy between the sensory and the callosal response of the visual area seems to indicate that the system of retino-geniculo-cortical fibers (and neurones) which is responsible for the characteristic pattern of the sensory response is prolonged beyond the primary visual cortex in the commissural fiber-tract connecting the left and right homologous areas. As a physiological interhemispheric transfer between homologous receiving areas (visual, auditory and somatosensory) has been demonstrated by psycho-physiological (13) and electro-physiological(14) experiments, the *raison d'être* of the callosal prolongation of this system seems to be looked for in the necessity of conserving the spatio-temporal pattern, and correlatively the information, of the sensory message during its interhemispheric transfer.

Summary. The reaction of the visual area in the unanesthetized cat to a synchronized volley of callosal impulses is markedly similar to the response of the same area produced by a shock on the optic nerve. Like this response, it is characterized by an initial succession of spike-like deflections preceding the slower

cortical potentials. Various controls (confirming Chang and Kaada's conclusion for the sensory response) indicate that these spike-like potentials are in both cases afferent fiber potentials, and thus represent presynaptic events for the cortical neurones. The significance of the formal analogy between the sensory and the callosal response of visual area is discussed. A callosal volley can exert on a subsequent sensory response of the visual area the same facilitatory effect which has been described by the author for auditory-callosal and -sensory impulses.

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Influence of Pyridoxine on Transaminase Activity of Human Placenta, Maternal and Fetal Blood.* (21929)

M. B. GLENDENING, A. M. COHEN, AND E. W. PAGE.

From the Department of Obstetrics and Gynecology, University of California School of Medicine, San Francisco.

The response of pregnant women to tryptophane(1,2) and pyridoxal loading tests(3) are characteristic of subjects with vit. B_6 deficiency(4,5). The abnormal excretion of xanthurenic acid after tryptophane loading can be abolished by daily administration of 10 mg of pyridoxine hydrochloride(6). This would imply that the altered tryptophane metabolism in normal pregnancy is the result of a deficiency in vit. B_6. Nevertheless, Vilter *et al.*(7) were "unable to demonstrate any other evidence of vit. B_6 deficiency by blood, urine, or tissue levels of this vitamin, or by measuring output of pyridoxic acid in urine." It would seem desirable, therefore, to search for some other evidence of vit. B_6 deficiency to justify large supplements of pyridoxine to diets of pregnant women. There is considerable evidence that pyridoxine derivatives, pyridoxal phosphate and pyridoxamine phosphate, serve as coenzymes of transamination reactions(8). Some tissues of pyridoxine deficient animals have a reduced transaminase activity.

Therefore, we investigated the effect of pyridoxine supplements on transaminase activity of certain fetal and maternal tissues. Blood levels were studied, inasmuch as Marsh, Greenberg and Rinehart(9) have demonstrated a correlation between pyridoxine intake and glutamic-aspartic transaminase activity of hemolyzed blood in monkeys and man. The placenta was also studied because it is the only other available fetal tissue.

Methods. Subjects were divided as follows: Group I: Ten non-pregnant healthy women who did not receive a pyridoxine supplement. Group II: Eighteen pregnant women without pyridoxine supplement.

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