classified into 2 large groups—composed, in one instance, of all the Friedländer bacilli, and in the other, of the organisms of rhinoscleroma, ozaena, granuloma inguinale and *Bact. aerogenes*. Whether the serological distinctions indicate that Friedländer bacilli arise genetically from one source, and the remaining organisms from a second and different source, remains for future investigation to solve.

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Modification by Strychnine of Response of the Optic Cortex.*

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Stimulation of the optic nerve of the rabbit by a single shock results in a sequence of potential changes recorded from the optic cortex which occupy 1/5 second. At threshold for the response, the first potential is a monophasic surface-positive wave, followed by a surface-negative, and this in turn by a surface-positive deflection. Above threshold, the initial positive wave is covered up by a larger diphasic response (Bartley and Bishop[2]). Ether depresses this diphasic response, and strychnine increases it differentially (Bartley[1]), as compared to the sequence initiated by the monophasic wave. Dilute strychnine applied locally to the cortical surface may increase the diphasic component by 500% without any change in the amplitude of later parts of the record. Higher concentrations depress the late components to extinction, and increase the diphasic wave still further. Finally, spontaneous responses occur, first singly, then in trains. Whether recorded from across the whole cortex, or from needles subtending only certain strata, this spontaneous wave duplicates the diphasic response to stimulation both in relative amplitude of the 2 phases and in duration. The spontaneous rhythmic activity which is present before the application of strychnine, decreases and disappears parallel with the disappearance of the later components of the stimulated response. Facilitation to a second response, which accompanies the late surface-positive wave of

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1 Bartley, S. H., *Am. J. Physiol.*, 1933, **103**, 203.

2 Bartley, S. H., and Bishop, G. H., *Am. J. Physiol.*, 1933, **103**, 159.

the normal record, disappears as this component is suppressed by strychnine.

Strychnine thus serves to differentiate 2 sequences of potential, one consisting of the 2 phases of the early diphasic component, lasting about 20 ms., the other consisting of the triphasic sequence of 3 slow waves lasting 200 ms. The latter can be correlated with the normal spontaneous 5 per second rhythm in a number of respects (Bishop[3]), to the extent that it has been inferred to occupy the same cortical elements. It is presumably not the immediate correlate of vision, both because it it not suppressed by a degree of narcosis that would abolish visual function, and because the spontaneous activity goes on even after cutting, and in fact after degeneration of the optic nerve. The former diphasic process is inferred to be the immediate visual one. Its marked increase by strychnine corresponds to the increased functional excitability of spinal cord and motor cortex under this drug, as indicated by peripheral reflex and motor effects.

Recorded from pairs of needle electrodes subtending different strata of the cortex, the potentials observed indicate that these two processes take different routes. The first potential of the diphasic process indicates that the middle strata are negative to those above, while the second potential indicates that the upper strata are negative to the lower, or in some cases both upper and lower negative to the middle. The progress of the activity represented by this would therefore seem to be mainly from the middle layers of the cortex upward, to discharge via the plexiform white matter, and perhaps also via the subcortical white matter. The triphasic process similarly originates in the middle or lower cortical layers, and progresses upward, but during the third potential of this series occupies the whole cortex, the greatest negativity being toward the deepest strata. It is inferred to involve the discharge of pyramid cells whose axons leave the cortex via the white matter below the 6th layer.

This analysis applies only to what may be termed the mass-impulse, and not to the discharges of single elements. That is, while the mass impulse represented by the diphasic process appears to discharge in general upward toward the surface white matter, it cannot be said that no discharge takes place during this time in the reverse direction, or laterally, but only that the center of greatest activity as indicated by vertically oriented electrodes progresses upward. Similarly, during the third potential of the triphasic series,

[3] Bishop, G. H., *Cold Spring Harbor Symposium*, 1936, **4**, 305.

an increasing negativity from the surface to the subcortical white matter suggests a predominance of downwardly directed impulses. The facilitation to a second stimulus accompanying this potential presumably involves a cortico-thalamic discharge.

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Effects of Sugar, Glycerin and Urea on Hormones of Cattle Anterior Pituitary Glands.*

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In a series of former investigations we have distinguished essentially 3 types of effects of anterior pituitary glands on the ovary: (1) The destruction of follicles; (2) various luteinization processes, and (3) the full growth and maturation of follicles, followed in some cases by ovulation and formation of true corpora lutea. We also studied the relation of the thyroid-stimulating hormone to the substances affecting the ovaries. At first we noticed a close association between the thyroid-stimulating hormone and the substances inducing atresia and luteinization processes in the ovary. We considered it, therefore, probable that the thyroid-stimulating hormone and atresin, which is responsible for the destruction of ovarian follicles, were one and the same substance.[1] However, subsequently we developed a method which made possible the analysis of the effects produced by the anterior pituitary glands of various species by subjecting these organs *in vitro* to the action of various solutions.[2] The results of these experiments indicated that the effects of hormones on the thyroid gland were distinct from those acting on the ovary. In the present investigation we extended the application of this method by immersing the anterior pituitary glands of cattle in glycerin and in solutions of cane sugar and urea before transplanting them subcutaneously into guinea pigs. One cattle gland, or parts of a cattle gland were immersed in 80 cc. of the fluid for various periods of

* These experiments were carried out with the aid of a grant from the International Cancer Research Foundation and of a grant for research in science made to Washington University by the Rockefeller Foundation.

1 Loeb, Leo, Volume jubilaire dédié an Prof. Lina Stern, Moscow, 1935, p. 405.

2 Loeb, Leo, Anderson, H. C., Saxton, John, Hayward, S. J., and Kippen, A. A., *Science*, 1935, **82**, 331.