This coloration was evident in mice sacrificed 24 and 48 hours after injection, while no coloration of other organs was noticeable. In animals sacrificed 30 minutes after injection, the bone was colored, but dye was found also in blood, liver and spleen.

In Table I, the physico-chemical and osteotropic properties of the above bismuth preparation are compared with that of Alizarine, Purpurine, Congo Red, Trypan Blue, Oxalates, and Fluorides.

From a comparison of the physico-chemical properties of fluoride, oxalate, sulfo-alizarine ions, etc., and the above bismuth compound, it can be assumed that the fixation of the bismuth complex in bone takes place by the same mechanism as reported for these ions, *i. e.*, by the formation of an insoluble complex with calcium phosphate, and simultaneous release of PO_4 ions.[3]

Use of the above bismuth preparation in experimental syphilis in rabbits indicates that it exerts its therapeutic influence after the intravenous injection of 4.5 mg Bi per kg given in 3 divided doses. In mice the tolerated dose by i.v. injection is 2.4 mg Bi per kg compared to 5 mg Bi when given as sodium bismuth tartrate.

13425 P

Electroencephalographic Studies: Slow Activity During Hyperventilation in Relation to Age.

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Previous studies have shown that hyperventilation very easily produces slow activity with frequencies of less than 7 cycles per second (delta activity) in the electroencephalograms of children.[1, 2] However, no systematic research has been undertaken as yet, for studying precisely the relationship between this slow activity and age. Two hundred records taken in the Electroencephalography Laboratory of Mount Sinai Hospital were analyzed for this purpose.

Method. The following groups of patients were examined: (1) idiopathic epilepsy (non-deteriorated), (2) symptomatic epilepsy, excluding patients with brain tumor, (3) non-epileptics with

[3] Ercoli, N., *Boll. Società Italiana Biologia Sperimentale*, 1939, **14**, 16.

[1] Gibbs, F. A., and Gibbs, E. L., *Atlas of Electroencephalography*, 1941, p. 88.

[2] Brill, N. Q., and Seidemann, H., *Arch. Neurol.*, 1941, **46**, 374.

headache, fainting, dizziness, etc., without indication of organic disease of the brain, (4) organic disease of the brain, except where the great amount of spontaneous delta activity made it impossible to estimate changes in delta activity during hyperventilation, (5) patients suffering from a variety of systemic diseases associated with hypoglycemia (Addison's Disease, hepatitis, etc.).

Hyperventilation was induced for at least 2 minutes immediately after a 20-minute record was taken under standard resting conditions. Some patients were fasting; others were examined 2½ to 3 hours after breakfast. Some patients had their blood sugar examined immediately after the hyperventilation period; others received a sugar injection intravenously (50 ml 50% glucose solution). These patients were hyperventilated before and after the sugar injection. The percentage of time of the record occupied by delta activity (% delta time) was determined in all cases. Three values were determined in such cases in which delta activity was present in the spontaneous records: (1) % delta time during hyperventilation (2 minutes), (2) % delta time before hyperventilation (2 minutes), (3) the difference between (1) and (2). The latent time was determined for each record, representing the time from the start of hyperventilation until the appearance of the first burst of slow waves of high amplitude. The percentage of negative findings (absence of slow waves) as a function of age was determined for each group.

Results. Whatever group is considered and whatever delta index is employed, in spite of the great dispersion of individual data, there is a close relationship between the amount of delta activity during the hyperventilation and the age. With an increase in age, the latent time and the percentage of negative findings increase while the total amount of delta activity decreases. The amount of slow activity decreases with age very rapidly up to 15-18 years. After this age, the change becomes much slower up to the age of 25-30 years. After the age of 35-40 the data related to the patients in Groups (1) and (3) are insufficient to warrant any significant correlation with age. However, the data relating to Groups (2) and (5) show that the amount of delta activity is further reduced with increasing age, even after the 35th year.

The average amount of delta activity after hyperventilation is higher in subjects with idiopathic epilepsy than in subjects of Group (3). This difference, in the greatest number of cases, is due to the spontaneous delta activity of the epileptics. The spontaneous delta activity shown by our group of idiopathic epileptics is related to the age in approximately the same manner as the delta activity during hyperventilation.

There is relatively little difference between data concerning fasting and non-fasting patients. This difference concerns the adults predominantly. No significant relationship was found between the blood sugar and the delta activity in a group of 17 subjects of different ages. However, none of these subjects showed a blood sugar below 60 mg % and only 2 presented values above 100 mg %. After glucose injection the delta activity is suppressed or reduced more in adolescents and adults than in children. Subjects with disturbances of carbohydrate metabolism (hypoglycemia, and particularly Addison's Disease) show a great amount of delta activity during hyperventilation,[3] and a slow decrease of this activity with age. Subjects with symptomatic epilepsy generally show a higher amount of delta activity (with shorter latent time) than patients with idiopathic epilepsy. In symptomatic epilepsy the decrease of the slow activity with advancing age is slower than in Groups (1) and (3). Some subjects more than 40 years of age and suffering from organic cerebral diseases (Group 4), show, during hyperventilation, an unusually high increase in delta activity for their age.

On a semi-logarithmic scale the amount of delta activity was plotted against age for the following groups: 1. spontaneous delta activity in epileptics, 2. induced delta activity in (a) non-epileptics, (b) idiopathic epilepsy, (c) symptomatic epilepsy, (d) patients with hypoglycemia, (e) after glucose injection. All curves obtained converge to the same point corresponding to the maximum possible delta activity (100% delta time) and to the age of about 3 years.

Summary. There is a definite relationship between the age and the amount of slow activity during hyperventilation in epileptic and non-epileptic patients. An analogous relationship to age was found for the spontaneous delta activity of patients with idiopathic epilepsy.

13426

K-Strophanthin-β, K-Strophanthoside, Periplocymarin, and Periplocin.

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From the pioneer work of Arnaud[1] to the elaborate investigation of Brauns and Clossen,[2] the only crystalline principle believed to

[3] Engel, G. L., and Margolin, S. G., to be published.