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Encephalography with Anesthetic Gases in Man.†

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Anesthetic gases were first used for encephalography by Aird,[1] who reported an experimental series in dogs in February, 1934. He found nitrous oxide and ethylene the most suitable, and felt that a definite anesthesia or sedation was produced in the animals by the injected gas.

On March 6, 1934, we did our first encephalography with nitrous oxide in man. Eight encephalographies were done with this gas, with good radiological results in 3, fair in 4, and poor in one. The subarachnoid channels showed poorly, due to extremely rapid absorption of the subarachnoid gas. The ventricular gas was almost completely absorbed in 24 hours. The immediate reaction to the

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1 Aird, R. B., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 715.

injection did not differ from that when air is employed, no evidence of anesthesia or sedation being noted. However, post-injection headache was greatly reduced.

Subsequent to November, 1934, we substituted ethylene for nitrous oxide, and have done 26 encephalographies with this gas. The reaction of the patients did not differ from that to nitrous oxide, but the radiological results were better, being good in 20 cases, fair in 5, and poor in one. The necessary period of hospitalization after the injection was reduced from an average of 3 days when air was used to 1.85 days with ethylene. Lumbar puncture the following day in 2 cases showed cell counts of 1200 and 1400, mainly lymphocytes, comparable to counts reported after air. In one subject the spinal fluid pressure was followed for 5

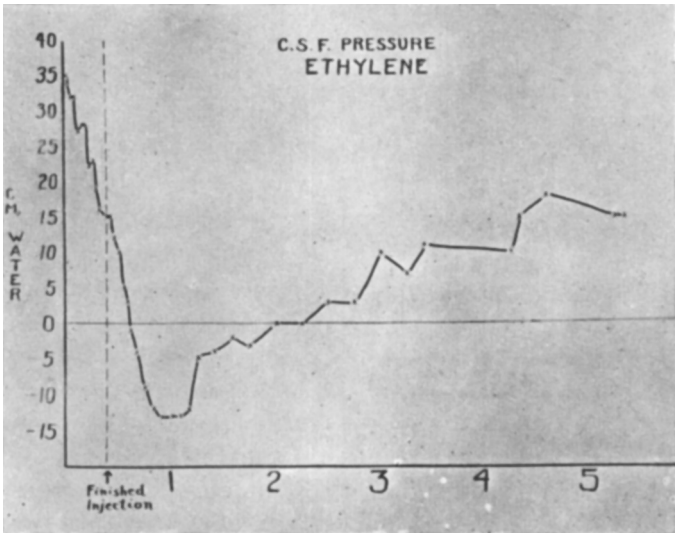

FIG. 1.
Spinal fluid pressure following encephalography with ethylene in man.

hours after the injection, as shown in Figure 1. The negative pressure of 13 cm. of water is due no doubt to the gas, by its relatively great solubility, being absorbed more rapidly than fluid could be formed. The possible consequences of such a marked change in pressure warrant consideration.