trols residing in the epidemic zone, as compared with 14% of 159 well persons tested remote from the epidemic.

All (100%) of 6 cases of encephalitis in from the second to the fourth day of the disease gave a strongly positive skin test following injection of the heat-killed streptococcus isolated from the spinal fluid of acute cases. Only 4 (11%) of 37 cases in from the eighth day to the fourteenth day of the disease gave a positive reaction. The incidence of a positive skin test in different groups of persons residing within, and remote from, the epidemic zone ranged from 48 to 72%. The marked reduction in incidence of positive reactions during recovery from encephalitis occurred only in the case of the antigen prepared from the streptococcus of encephalitis. The incidence of positive Schick and Dick tests was about the same among the patients with encephalitis, irrespective of the time of the attack, as it was among well persons, and in all instances reaction was nearly always absent to the antigen prepared with streptococci isolated from the nasopharynges of well persons.

Thus far 4 of 12 strains of streptococci that had manifested characteristic virulence, when placed in milk, resisted heating to 63°C. (145°F.) for 30 minutes and retained their virulence if cultures for viability and animal inoculation were made in tall tubes of dextrose-brain broth.

7095 C

Ether Hyperglycemia.

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Glycosuria following etherization was first observed by Reynoso,[1] while the increase of blood sugar accompanying ether anesthesia was first reported by Seelig.[2] Section of the nerves to the liver does not prevent the hyperglycemia resulting from the administration of ether.[3] If the adrenals are inactivated, however, this rise in blood sugar is in large part prevented, as Keeton and Ross[4] showed.

That adrenin rather than the action of sympathetic impulses is the potent factor in liberating sugar from the liver has been shown by Bulatao and Cannon[5] and by Britton.[6] Reid[7] had advanced

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evidence that the hyperglycemia resulting from etherization is due to secretion of adrenin. But after removal of the adrenal factor ether still produces an increase of blood sugar. The demonstration by Cannon and Bacq,[8] that stimulation of the sympathetic nerves produces sympathin and that sympathin resembles adrenin in action, suggested that the residual hyperglycemia from etherization after adrenal influence had been excluded might result from the action of sympathin. If this idea were correct the level of blood sugar should not rise when ether is administered to completely sympathectomized animals.

Healthy adult cats were maintained in good condition on an adequate diet and fasted for 24 hours before the experiment. Blood (0.1 cc.) was drawn from an ear vein for sugar determinations, which were made in duplicate by the Folin-Svedberg[9] method. The sugar level was determined before etherization and every 15 minutes thereafter, during the administration of the ether, for one hour. A final analysis was made one hour after cessation of the anesthesia. The ether was administered carefully in order to avoid struggle and to minimize emotional reactions. As soon as relaxation was obtained a tube was inserted between the vocal cords into the trachea, and artificial respiration was started in order to avoid asphyxia. The depth of the anesthesia was regulated so that the corneal reflex was just present. Experiments were performed on normal cats, on cats with the left adrenal denervated, the right removed and the hepatic nerves cut,[5] and on cats completely sympathectomized.[10] The completeness of the sympathectomy was assured by noting absence of erection of the hairs on exposure to cold or during emotional excitement. Careful necropsy verified these findings.

The actual figures for a single experiment only are given in the chart, but each result has been fully confirmed. The well-known hyperglycemia of etherization is shown in Fig. 1A. If the adrenals

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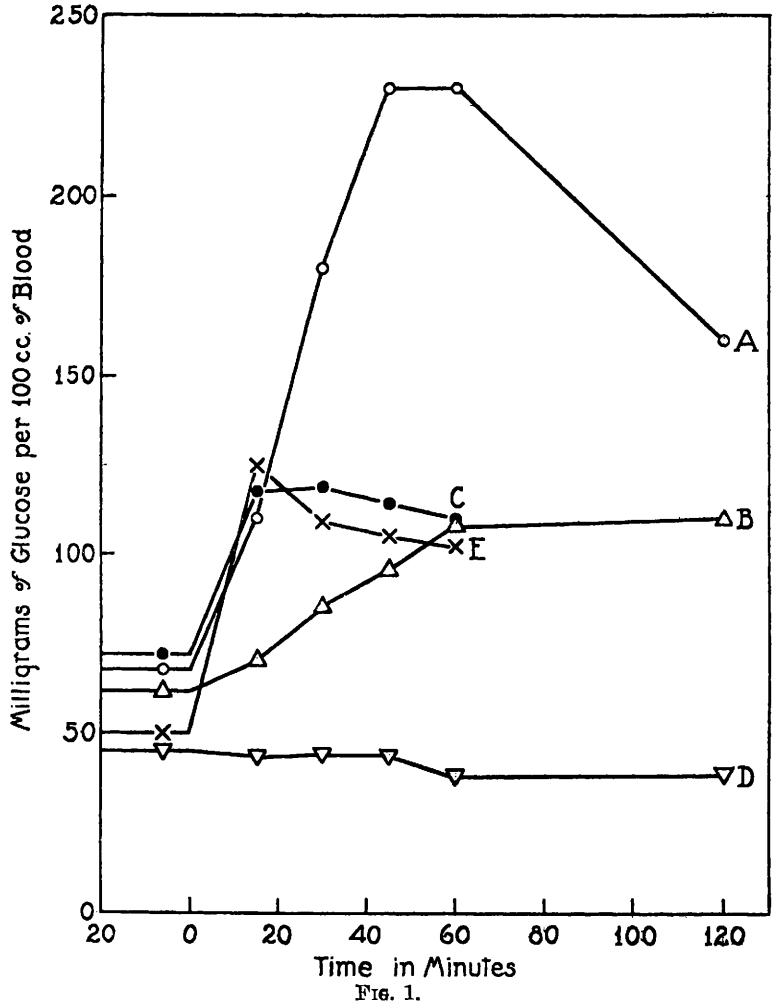

FIG. 1.

Adult cats fasted 24 hours previously. Ether administered from 0 to 60 minutes. A. Normal. B. Right adrenal removed, left adrenal denervated and liver nerves cut 10 days previously. C. Sympathectomy completed 3 weeks previously. D. Same preparation as C, but with adrenals removed aseptically 24 hours previously. E. Sympathectomy completed 2 weeks previously; adrenals removed 7 hours before etherization.

are inactivated and the liver nerves cut, this rise in blood sugar is considerably reduced (Fig. 1B). Sympathectomy does not abolish this increase in the glycemic level, as can be seen from Fig. 1C.

It is known that asphyxia can stimulate medulli-adrenal secretion directly, even if all connections of the adrenals to the central nervous system have been severed.[11] It seemed possible that the increase in

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blood sugar observed in the completely sympathectomized animal was due to the direct stimulating action of ether upon the adrenals. Both adrenals were therefore removed aseptically in the completely sympathectomized animal shown in Fig. 1C. Twenty hours later, ether again was administered for one hour and no rise in blood sugar was obtained (Fig. 1D). The low fasting blood sugar in this cat made us suspect that the liver might have been deficient in glycogen, a condition which has been reported after bilateral adrenalectomy.[12] Ether was therefore administered to a completely sympathectomized cat seven hours after bilateral adrenalectomy. An increase in blood sugar (Fig. 1E) was readily demonstrable.

The mechanism of the rise of blood sugar which takes place on etherization after ruling out the sympathico-adrenal factor is unexplained.

Summary. The elevation of the blood-sugar level in cats on etherization (Fig. 1A) is considerably reduced by inactivating the adrenals and cutting the liver nerves (Fig. 1B).

The residual increase persists in the completely sympathectomized animal (Fig. 1C), and therefore does not result from the production of sympathin.

The persistent hyperglycemia does not depend upon direct stimulation of adrenal secretion by ether since it is still present when both adrenals have been removed in the completely sympathectomized cat (Fig. 1E).

7096 C

Toxic Effect of Sodium Monoiodoacetate on Trypanosomes.

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It has been demonstrated by several investigators[1-7] that mono-

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