The color produced by the hormone preparation in the carbazole reaction was compared with those yielded by glucose, mannose, galactose and equimolar mixtures of all the pairs of these sugars. Determinations of the relative transmission of light in the spectral regions 420, 520, 540 and 660 mμ were made by means of an Evelyn photoelectric photometer. The characteristic ratios of extinction coefficients at two wave-lengths (*e.g.*, 420 and 520 mμ) for glucose, mannose, glucose-galactose and galactose-mannose were found to be different from that given by our hormone preparations, while galactose and a glucose-mannose mixture could not be distinguished from the hormone by this method.

To differentiate between our hormone preparation and galactose or a glucose-mannose mixture the orcinol method as modified by Sörensen and Haugaard[9] was utilized. Solutions of the hormone preparation, galactose and the glucose-mannose mixture (each in 3 different dilutions) were heated 20 minutes at 80–81° with the orcinol reagent and the colors compared at 420 and 520 mμ. The ratios of the extinction coefficients for our preparations and the glucose-mannose mixture were different, while those for the hormone preparation and galactose were similar.

As both the orcinol and carbazole methods gave ratios of extinction coefficients for our hormone preparations which agreed well with those obtained for galactose, we conclude that the nonhexosamine sugar of our gonadotropic hormone preparations consists entirely of galactose units. Obviously final proof of the nature of the carbohydrate must await its isolation and characterization. It must be further emphasized that the presence of several galactose units along with a single different hexose molecule would be extremely difficult to detect by the methods we have employed. However, we consider this possibility to be unlikely.

Further details of the above study will be published shortly.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

INTRAVENOUS INFUSION PUMP[1]

FOR intravenous infusion in animals, it is desirable to have an automatic device which is simple, is easily adjusted to deliver various amounts and has a high degree of accuracy. The following apparatus seems to meet these requirements and is designed and used for the digitalis cat-assay. It consists essentially of a stopcock, turned by a constant speed motor, which in one position connects a pipette with a reservoir from which it is filled and in the other position connects the pipette with the vein into which it empties (see Fig. 1). The filling level (F) of the pipette is determined by the position of the reservoir. The emptying level (E) is determined by the position of a device which makes it independent of venous pressure variations, and which has been used in a perfusion method for isolated organs with constant volumes of fluid[2]: The venous canula is connected with the lower end of a vertical glass tube (25 cm length, 0.4 cm inside diameter), which has a short T arm sealed close to its open top. One opening of the stopcock is connected with this T arm, and the fluid (from the pipette) enters the glass tube, runs down along the walls of the tube, at the lower end of which it is collected as a fluid column which flows into the vein. (A wool thread in the glass tube, stretching

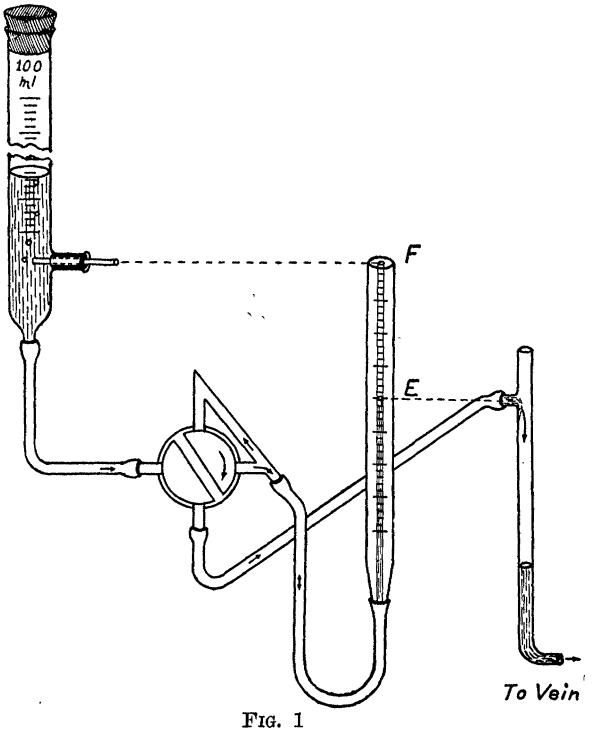

FIG. 1

[9] M. Sörensen and G. Haugaard, *Biochem. Zeit.*, 260: 247, 1933.

[1] Aided by a grant from the David Trautman Schwartz Research Fund and a grant to Dr. Erwin E. Nelson from the United States Pharmacopoeia XI Revision Committee.

[2] G. Katz, *Arch. Intern. Pharmacodyn. et Therap.*, 44: 1934, 239.

from the top to the bottom, helps to guide the fluid down and prevents it from clogging the narrow tube and enclosing air bubbles.) By completely exposing the vein to a length of 2–5 cm and using a canula with a fairly narrow opening, blood is prevented from entering the canula. The height of the fluid column is determined by venous pressure and canula resistance and obviously does not influence the inflow from the pipette into the open tube. Incidentally, since it follows venous pressure changes, it might be used to indicate a sharp endpoint in the digitalis assay; the ceasing of the heart action, by increasing the venous pressure, suddenly raises the fluid level; this is followed by a drop, representing the complete arrest of the heart.

The reservoir, which is a burette used as Mariotte-bottle and thus delivers under nearly constant pressure, and the pipette are clamped to one stand, which by means of a rack and pinion can be raised or lowered. The pipette is shortened by cutting it off at the zero level, where it is ground with emery. Its height is adjusted so that it is completely filled from the reservoir without overflowing, the surface tension provided by the dry, ground top preventing the fluid from leaving the lumen even when the air-inlet tube of the reservoir is somewhat above the zero level of the pipette. This preparation of the pipette eliminates a slightly inaccurate filling which would otherwise occasionally occur from the inflow disturbance caused by the air bubbles entering the Mariotte-burette. The venous inflow tube is clamped to a second stand, at a height determined by the position of the animal. The position of reservoir and pipette above the entrance point of the fluid into the inflow tube determines the emptying level of the pipette, which is easily adjusted by turning the pinion, with the motor running. The level to which the pipette empties represents the amount of fluid per "stroke" which, together with the number of revolutions of the stopcock, determines the amount infused per minute. (A revolution counter, driven by the stopcock, allows of calculating the total amount infused at any given time more accurately than can be done by reading the burette level.) The synchronous motor (Telechron, C2M) has one r.p.m. of the shaft, which, by means of two gears, drives the stopcock at 3 r.p.m.; this makes for 6 infusions per minute, which are more or less leveled out in the glass tube. The accuracy of the pump depends solely on the accuracy of the pipette. For our purposes, a "Kahn pipette" (0.2 ml, calibrated in 0.001 ml) is being used.

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AN EASY METHOD FOR MAKING AN INDEX

RECENTLY confronted again with the odious task of preparing an index for a book of more than a hundred pages, I sought for an easier method than writing the entries on twenty-six sheets lettered A to Z and then alphabetizing each sheet. I also wanted a less expensive and time-absorbing technique than using a separate filing card for each entry. The plan hit upon worked very well. Sheets of typewritter paper were fed into the typewriter. On each with double spacing were typed the needed entries, starting each entry on a new line:

Light for photosynthesis 95
Photosynthesis, light for 95
Transpired water 96
Water, transpired 96

With a photographic trimmer, the lines were later chopped apart and sorted into piles A to Z. A roll of Scotch tape was then partly unrolled, placed on the opposite side of the work table with the unwound part toward me, adhesive face up. The Z slips were arranged alphabetically and pressed to the nearer end of the tape, starting with the last of the group. Next the Y slips, and so on. The tape was later cut between slips at about eleven-inch intervals and made satisfactory copy for typing out the complete index, starting at Aa, the last slip fastened in place.

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BOOKS RECEIVED

Australasian Antarctic Expedition, 1911–14, Scientific Reports, Series C, Zoology and Botany; Vol. I, Part 3, Parasitic Infusoria from Macquarie Island, by T. Harvey Johnston. Pp. 12. 26 figures. 2/6–; *Vol. II, Part 4, Amphipoda Gammaridea*, by G. E. Nicholls. Pp. 145. 67 figures. 17/6–; *Part 8, Pycnogonida*, by Isabella Gordon. Pp. 40. 8 figures. 5/6–. Paisley, Sydney, Australia.

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