TABLE I.
Effect of Fluorine on Caries Incidence.

Diet constituent varied	No. rats	No. cavities per rat, av. ± s.d.	No. cusps involved per rat, av. ± s.d.	No. caries-free rats
Powdered milk	40	3.5 ± 1.2	10.6 ± 4.5	0
Casein	42	3.0 ± 1.1	9.0 ± 3.3	0
Casein and fluorine	42	1.1 ± 1.0	3.1 ± 3.6	13

lower teeth had 145 cavities with 360 cusps involved. The variation of corn particle size was found to be unimportant; this was to be expected since all the diets contained particles larger than 20 mesh.

There is little doubt that fluorine not casein is responsible for the diminished incidence of fractured and carious teeth. Therefore, the caries reduction reported by Lilly can probably be attributed to fluorine contamination of the casein which he fed.

10893

Acceleration of Hemolysis in Relation to Chemical Structure. II. The Straight-Chain Alcohols.

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One of us (Ponder[1]) has already discussed the relation between the chemical structure of the benzene derivatives and the extent to which they accelerate hemolysis by the simple lysins, and has formulated a single expression to indicate the accelerating power of any substance in any concentration.* This note considers acceleration by the straight chain alcohols, from propyl to nonyl.

Method. The method used was that described by Ponder.[1] By a comparison of 2 time-dilution curves the acceleration for a given concentration of alcohol was determined. From this R value and the concentration of alcohol in mM/l, a value for (1-R)/c was obtained.†

As with the benzene derivatives, the solubility of the higher alco-

[1] Ponder, E., *J. Exp. Biol.*, 1939, **16**, 38.

* Published in *J. Exp. Biol.*, 1939, **16**, 38.

† Previously we have used (R-1)/c as a measure of acceleration or inhibition. Here we use (1-R)/c as a measure of acceleration in order to avoid obtaining logarithms of negative values. This is merely a mathematical transformation.

hols in water is very small and great care has to be taken to obtain known amounts in solution. In all cases below amyl alcohol the concentration employed was as close to saturation as possible. Propyl alcohol showed no acceleration in concentrations as great as 1.5 M/1. In higher concentrations, about 5 M/1, this alcohol is lytic *per se* (Gordon[2]). Butyl and amyl alcohols are relatively soluble in water and it was unnecessary to approach saturation to get sufficiently concentrated solutions for acceleration. The concentrations used are given in Column 2 of Table I.

TABLE I.

Alcohol	Concentration mM/1	R	(1-R)/c
Propyl	1,500	.99	—
Butyl	250	.67	.0014
Amyl	100	.38	.0062
Hexyl	5	.875	.025
Heptyl	2	.85	.075
Caprylic	2	.774	.116
Nonyl	0.5	.506	.988

The alcohols used were obtained from Eastman Kodak Company, and had boiling-point ranges of not more than 5°C. Saponin in dilutions of 1:10,000 to 1:60,000 was used as the lysin throughout. Time-dilution curves were plotted at 25°C in isotonic NaCl.

Results. In Table I the results with the various alcohols are summarized.

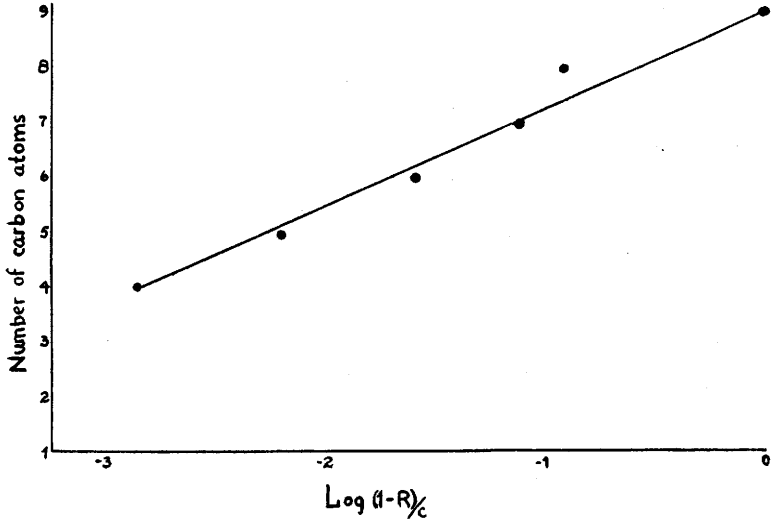

FIG. 1.

[2] Gordon, A. S., *J. Exp. Biol.*, 1932, **9**, 336.

In Fig. 1 the logarithm of (1-R)/c is plotted against the number of carbon atoms in the alcohol. The resulting curve approximates to a straight line. The slope of this line is approximately 1.75; it intersects the zero of the logarithmic scale at approximately 9 carbons. Using N for the number of carbon atoms, and A to replace (1-R)/c the equation of the line becomes:

$$N = 1.75 \log A + 9,$$

so that there is a logarithmic relation between the number of carbon atoms in any straight chain alcohol and its power as an accelerator of hemolysis. There is some suggestion here of a relation to Traube's Rule, the acceleration being connected with an accumulation of the alcohol in the surface. Such an accumulation occurs in the case of acceleration of the benzene derivatives, but the methods at our disposal, when applied to such dilute solutions, make it impossible to decide the matter one way or the other.

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Uterine Distention and Maintenance of Pregnancy Following Oöphorectomy in the Rat.*

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One of the writers has reported[1] that removal of ovaries in the rat need not result in interruption of pregnancy, provided but one fetus be retained and that the placentae of removed fetuses be left *in situ*. On the basis of this finding, it was suggested that the placentae exercise some degree of endocrine function in the maintenance of gestation—not so well developed, perhaps, as in certain monotocous forms in which the ovaries may be dispensed with during an appreciable part of pregnancy, but sufficiently so that a number of placentae can maintain the gestation of a single surviving fetus; for further discussion reference may be made to the original paper.

Now, in view of the striking effects on uterine growth and development that have been reported to follow experimental disten-

* The experimental work was carried out at the Biological Laboratory, Cold Spring Harbor, Long Island, N. Y.

[1] Haterius, H. O., *Am. J. Physiol.*, 1936, **114**, 399.