Variations in Spermatogenesis of Oligospermic Men

In two cases of barren marriage due to severe oligospermia of the husbands, pregnancy occurred notwithstanding spermatic counts of 5,200,000 and 10,000,000 per c.c. Owing to the fact that both couples were extremely religious Jews, extra-conjugal relations could be excluded. Since fertilization with such low spermatic counts seemed improbable, it occurred to us that variations in the spermatogenetic function occur in certain cases of oligospermia. Thus, fertilization might take place at a time when higher spermatic levels are reached.

We have, therefore, examined a group of twenty-one men selected on the basis of a very low spermatic count on first semen examination (less than 10 million per c.c. in twelve cases, less than 20 million per c.c. in five cases and less than 30 million per c.c. in four cases). The total number of spermatozoa in the ejaculate was less than 90 million per c.c. in each. In all these cases the wives were excluded as responsible for barrenness. In order to study the spermatogenic function, five to seven semen analyses were performed in each case. Each specimen was taken after a period of abstinence of five days.

These semen analyses revealed two types of spermatogenesis in this series. In the first type (thirteen cases) the spermatozoal count was fairly constant, and the differences between any two spermatic counts did not exceed 12 million per c.c. The other seminal characteristics associated with spermatogenesis (sperm motility and percentage of normal spermatozoal) were also quite constant. In the second type (eight cases), extreme variations in the spermatozoal count were observed on repeated examinations. These variations in the spermatic density were as much as 43·5 million per c.c. in the same patient, at different examinations. In five of these cases values as high as 60 million per c.c. were reached. The other spermatic characteristics (motility and morphologically normal spermatozoa) also showed significant variations, although not so striking as the spermatic density.

During the period of observation (4–23 months) conception occurred in two of these barren marriages. In both cases the husbands belonged to this second type of oligospermia.

These observations lead us to distinguish between two types of oligospermia: (1) constant oligospermia, characterized by constancy of a poor spermatogenetic function; and (2) periodic oligospermia, characterized by periodic variations in spermatogenic characteristics, so that in one or more of a series of semen analyses normal values may be reached. Fertilization in this type of oligospermia may well occur.

The value of any therapeutic agent in the treatment of oligospermia should be studied only in cases of constant oligospermia. In view of the above reported observations, many therapeutic reports in cases of oligospermia might be considered as doubtful.

A detailed report of this study will be published elsewhere.

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Oct. 12.

Honeydew on Lime Trees

The dry summer of 1947 led to the accumulation of large amounts of honeydew secreted by the aphis *Therioaphis tiliæ* (L.) on the leaves of European lime trees. Sufficient often dripped to the earth to give a hard coating to the surface.

Portions of leaves (40 gm. dry weight) were gathered by tearing off the edges bearing the honeydew, which had sometimes dried to form a white solid. The leaves were steeped in cold water for 30 min. and the extract (440 ml.) filtered, giving a clear, slightly green liquid. Soil (230 gm.) was scraped from beneath a lime tree and extracted with 200 ml. water. After being heated on the water bath for 45 min. the extract was centrifuged and filtered, yielding a clear, green-brown solution.

Total fructose was estimated in these extracts by the method of Corcoran and Page[1], and reducing sugars were determined, before and after 15 min. hydrolysis at 100° C. in $N/2$ hydrochloric acid, by the method of Somogyi[2]. It was assumed that the hydrolysable non-reducing sugar was sucrose, and that reducing non-fructose sugar before and after hydrolysis was glucose.

Sugars excreted by aphis on European lime tree

	Gm. sugar/100 gm. leaf or soil			
	Sucrose	Glucose	Fructose	Total sugars
Leaves	12·3	8·3	9·2	29·8
Soil	4·7	1·5	1·4	7·6

The results given in the accompanying table show that the amount of sugars secreted by the aphis on to the leaves of lime trees is surprisingly large, and must amount to several kilograms for an average-sized tree. About half the total solids of both extracts consisted of sugars.

My thanks are due to Prof. C. H. O'Donoghue for his interest in this work.

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[1] Corcoran, A. C., and Page, I. H., *J. Biol. Chem.*, **127**, 606 (1939).
[2] Somogyi, M., *J. Biol. Chem.*, **160**, 61 (1945).

Structure of Cyclopropane

Although I am pleased to note that Dr. A. D. Walsh has made a final contribution to this discussion, it may nevertheless be possible to correct a mis-statement. He says[1] that I take the usual formula to represent only the position in space of the atoms involved. What I actually wrote was[2]: ". . . to the usual formulæ. These represent nothing more than the mode of linking of the atoms in the molecule, combined with an indication of the degree of symmetry of the statistical distribution of electrons". Or again[3]: "The formula represents only the mean position in space of the atoms (kernels) and the mode of binding (that is, the structure disclosed by analysis, synthesis, X-ray crystal evidence, etc.)".

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[1] Walsh, A. D., *Nature*, **160**, 903 (1947)
[2] Robinson, R., *Nature*, **159**, 400 (1947).
[3] Robinson, R., *Nature*, **160**, 162 (1947).