entity either secreting, with age, varying amounts of a substance or substances which activate agglutination, or, sperm undergo a cyclical change or changes as a result of which they become increasingly reactive to a given dose of agglutinin.

4738

The Factors that Modify Agglutination of Ageing Sperm.

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The previous studies demonstrated that ageing "dry" or concentrated sperm gave rise to a marked increase, then decrease in agglutination, provided, however, the sperm were not overripe when shed. In the present study, the sperm were overripened in a standard 1% suspension at 22° C. and tested at each age by samples of the same egg water. There was the same, but quicker, cyclical change. The first phase began in 5 to 20 minutes after the initial test. The second phase ended in 15 to 125 minutes. The third phase ended in 260 minutes. The increase in agglutination was from 77 to 328%.

The greater the overripeness of the dry sperm when shed, the earlier the maximum values, and the sooner was the cycle ended. When sperm was not overripe when shed, subsequent ageing gave rise to very little or no increased phase, followed by a decreasing phase.

The experiments were so devised as to eliminate such factors as a change in agglutinin, change in jelly content, change in temperature, or H ion concentration of the medium.

To determine whether the increase in agglutination was due to a substance or substances liberated by the sperm, increasing concentrations of sperm were tested with the same egg water solutions. The concentrations of sperm ranged from 1% to 25%. More concentrated suspensions could not be used, on account of the difficulty in distinguishing the agglutinated clusters in the thick medium. Sufficient time was allowed for the substance if present to be liberated. There was no change in agglutination values with the marked increase in concentration of sperm whether ripe or overripe.

The CO_2 liberated by the eggs and the active sperm plays a large rôle in decreasing the activity of the sperm, in clumping the sperm into aggregations, but plays no rôle in increasing the agglutination of ageing sperm.

This increase with overripening of either dry sperm or sperm in suspension is therefore held to be due not to a substance liberated by sperm but to a physiologic change in ageing sperm (as in the case of eggs). The physiologic changes include a change in metabolism, in permeability of the sperm wall, in viscosity of the protoplasm, and in a changed reactivity to a given dose of agglutinin. This cyclical change in reactivity is paralleled in the eggs by a cyclical liberation of agglutinin.

It is this cyclical physiologic change in eggs and in sperm which is held responsible for the initial vitalizing phase, the later devitalizing and senescent phases.

The results and interpretation with ageing sperm are in harmony with those obtained in agglutination of bacteria.

4739

Effects of Oxygen Therapy on Patients with Congestive Heart Failure.

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The effects of living for 2 to 5 weeks in an atmosphere containing 40 to 50% oxygen were studied in 5 patients with cardiac insufficiency. The Barach oxygen chamber, with constant temperature and humidity regulation, was used. Studies were made (a) with the patients in the ward, both before and after residence in the oxygen chamber; (b) with the patients in the oxygen chamber with normal (21%) atmospheric oxygen content; and (c) with the patients in the oxygen chamber with 40 to 50% of oxygen in the atmosphere. All other procedures, such as diet, fluid intake and the dosage of drugs, were kept sufficiently constant so that they did not modify the results. The usual clinical observations were recorded and in addition, measurements were made of the basal metabolic rate, pulmonary ventilation, vital capacity, arterial oxygen content, arterial CO_2 content, and the CO_2 dissociation curves of the arterial blood. From the latter were calculated the arterial oxygen saturation, arterial CO_2 tension and the arterial serum pH.

In one patient with mitral stenosis of long standing, great cardiac enlargement and marked chronic passive congestion but no per-