E. H. RELYVELD: **Toxine et antitoxine diphtériques. Etude immunologique.** Actualités scientifiques et industrielles: 1278, Hermann, Paris, 1959. 164 pp, 58 fig., 33 tables.

THIS monograph describes original experiments conducted to study the much discussed reactions between diphtheria toxin and antitoxin. In addition, each chapter contains a historical introduction and several useful techniques are fully described and discussed.

Crude diphtheria toxin (culture-filtrate), and therefore the anatoxin prepared from it, contains a large number of antigens besides the specific toxin. Corresponding anti-sera contains many "accessory antibodies" in addition to "antitoxin", this name being used to designate antibodies specifically reacting with the toxin, either to promote its precipitation or its neutralization.

A new semi-synthetic medium, containing casein hydrolysate, and optimal conditions for toxin production are described as well as two methods of toxin purification, one making use of the classical salting-out method, the other resorting to chromatography on calcium phosphate. A crystalline toxin titrating from 3·000 to 3·100 FU/mg N was obtained as well as a correspondingly pure anatoxin.

Tested by several methods of gel-precipitation, the purified toxin gave only one line of precipitation in response to homologous anti-serum as well as to anti-sera prepared with anatoxins of lesser purity and containing a number of accessory antibodies. Likewise, anti-serum against purified anatoxin gave a single line of precipitation when allowed to react in agar with crude toxin.

At the beginning of immunization in horses, diphtheria antibodies are associated with the γ-globulins and such anti-sera give a bell-shaped quantitative precipitation curve (type "rabbit). On the contrary, at the end of the hyperimmunization, diphtheria antibodies are associated with the β-2-globulins and the quantitative precipitation curve shows a rectilinear part and solubility of the precipitate in excess antibody (type "horse"). Under proper conditions, and with the help of ^{131}I, it was shown that antibodies, synthesized in response to the injection of pure anatoxin, can be of several kinds, some being able to flocculate without hardly neutralizing, while others neutralize without precipitating and others still act both ways. However, a study of the reactions of anti-serum with pure toxin partly degraded by a protease indicates that the toxin molecule is a single entity, provided with several determinants groups, each of which being able to induce the production of a distinct antibody, but only one of which being related to toxicity and therefore able to induce the production of neutralizing antibody.

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L. REY: **Conservation de la vie par le froid.** Actualités scientifiques et industrielles: 1279, Hermann, Paris, 1959. 167 pp, 84 fig.

SEVERAL chapters of this monograph deal with the physico-chemical processes intervening during the congealing of biological material to low temperature and with the description of techniques and apparatus used to achieve that aim.

From the biological point of view, original experiments are reported showing that, under proper conditions, heart tissue from the chick as well as skin from the rat or mouse, can be stored at low temperature (dry ice: -79 °C; or liquid nitrogen: -196 °C) for an indefinite length of time without showing, upon correctly performed re-heating up to body-temperature, any loss of their physiological activities.

In order to obtain such results, the tissues must be impregnated with glycerol before being cooled. There exists an optimal concentration of glycerol, as well as an optimal length of time for impregnation, which have to be found for each particular material under study.

The range of temperature between 0 ° and $-$ 50 °C is the most noxious to the tissues and therefore re-heating must be performed as quickly as possible.

The protection afforded by glycerol is explained by the following observations. Between 0 ° and -20 °C, it slows down the rate of propagation of the crystalline front, diminishes the size of the crystals, favours surfusion and has a tendency to maintain osmotic equilibrium while water is converted to ice. Between -20 ° and -80 °C, its presence gives more regularity to the process of crystallisation and favours the formation of vitreous structures.