

ed description of oxytuberculin, and in order that a better comparison may be made between the underlying principles involved in its manufacture and those of others, and to do this rightly reference must first be made to an event which is now classic in the annals of surgery and medicine.

In 1862, the late Sir Spencer Wells, opening the abdomen for the removal of what he believed to be an ovarian tumor, was surprised to find, instead, the intestines covered with pearly nodules, interspersed between which were gray granulations, fibrinous deposits in all directions, and a large amount of opalescent fluid. He quickly closed the abdomen, recognizing instantly that he had to deal with tuberculous peritonitis and believing that his action might cause the woman her death.

To his surprise the symptoms for which operation had been advised soon disappeared, and on re-opening the abdomen some time later it was found that the fluid had been absorbed and the tubercles had gone.

Since then laparotomy for the relief of tuberculous peritonitis has been looked upon as a justifiable and even a routine procedure, so much so, in fact, that Konig has recorded 131 cases with but 3% of deaths, Lindner 205 cases with mortality 7.5%, and Rorsch 358, with complete recovery in 250. (Allbutt, *System of Med.* iii., 670).

The theory most generally accepted is that of the oxygen so admitted being fatal to the bacillus tuberc., or more likely to its toxalbumins, as the bacillus itself is aerobic. This theory is indeed in line with the general constitutional therapy of sunlight and air advocated by all physicians for their consumptive patients; whilst in the great process of nitrification we see but another application of this law.

In studying this theory and the phenomena mentioned, Hirschfelder became convinced that the deleterious agent present in tuberculous peritonitis was really a tuberculine, such as Koch had artificially produced from veal bouillon and a culture of the bacillus; and that the admission of ozone to the abdominal cavity had, by destroying certain poisonous properties of this tuberculine, left a purified remedial agent, which he named Oxytuberculine. It was this oxytuberculine, he reasoned, which caused the tubercles to disappear, and at once he determined to cultivate if possible an artificial product. Accepting Koch's tuberculine (original) as the best to be obtained for the basis of his experiments, search was next made for the most suitable oxydising agent, which, after many experiments, was found to be Hydrogen peroxide,  $H_2O_2$ .

The first results were not gratifying and Hirschfelder substituted for Koch's tuberculine one made as follows: "A highly virulent culture of T.B.C. was floated upon veal bouillon containing 4% Glycerine, 1% Peptone and  $\frac{1}{2}\%$  Sod. Chloride, to every litre of which, when neutralized 3 c.c. of a normal solution of Soda Carb. was added." It will be noted that in both tuberculines an acid is generated, which of itself would be fatal to development after a certain point, but in the modified serum the alkalinity is ultimately restored. (Since T.R. has been placed upon the market it is used in preference to all others).

The remainder of the process is as follows: "A measured quantity of the tuberculine so formed is mixed with 1-10 the quantity of a 10 Vol Sol