

addition to Frankel's results, that there are other ways of conferring immunity against diphtheria. The addition, *e. g.*, of iodine trichloride in $\frac{1}{3}$ per cent. solution to cultures of four weeks old, for sixteen hours, attenuates them and makes them capable of conferring immunity against virulent cultures. Again, the fluid found in the cavity of a Guinea-pig which has died from experimental diphtheria, is to a certain degree toxic; but animals which recover from the injection of it prove to be immune.

Not only is iodine trichloride capable of attenuating the bacilli during cultivation outside the body, but it has a therapeutic value, for if 2 cc. of a 1 per cent. or 2 per cent. solution be injected in a Guinea-pig or rabbit, from one to six hours after infection with a virulent culture, the animals become sick, but do not die, and if the wound heals they prove to be immune.

Experiments with a view to ascertain whether iodine trichloride might be used therapeutically on children have given *negative results*. Dr. Behring is still searching for a medium which will counteract the morbid process in man.

If the iodine trichloride be introduced *before* infection, it produces no effect; but if hydrogen peroxide [in a slightly acid (sulphuric acid) 10 per cent. solution] be so introduced (the proper proportion to the body weight varies with different animals), the animals prove to be immune. This is a remarkable instance of immunity due to the introduction of a simple chemical substance: it does not stand alone, for Kitasato asserts that previous treatment with iodine trichloride renders rabbits immune to tetanus.

Although, so far, these experiments have only a scientific value, they show that animals which are naturally or artificially immune are so, not only against virulent cultures, but against the toxalbumins formed by these. That this property resides in the blood-serum of the immune animals, Behring concludes from the following experiments: Blood taken from rats (which are naturally immune to diphtheria), into which a considerable amount of the toxalbumin had been injected, produces no toxic effects in Guinea-pigs, while blood from non-immune animals, under similar circumstances, produces serious illness. Again, mice which have been treated with the blood of rabbits rendered immune to tetanus, are not only themselves immune to cultures in-

duced before the treatment, but even mice which are already tetanised, and which would certainly die in a few hours, can be *cured* by the intra-abdominal injection of such blood.

The possibility of curing in this manner an acute infectious disease during its course is, therefore, placed beyond a doubt.

These experiments, which are being conducted on diphtheria, tetanus, and typhoid, have already advanced so far as to show that we are on the eve of great discoveries with regard to the treatment of other bacterial diseases besides tuberculosis.

It is quite possible that in another letter I may have to report to you further progress in this respect. I hope to familiarize myself in the Hygienic Institute here with the very difficult technique necessary for successful experimentation in immunity, as you have no doubt learned from my letter to the Vice-Chancellor. From all I can learn, this is a necessary preliminary stage to the chief object of my mission here.

I am, yours sincerely,

R. RAMSAY WRIGHT.

BERLIN, Dec. 15th, 1890.

DR. J. FERGUSON, *President Tor. Med. Soc.*:

DEAR SIR,—I am thoroughly at work in Berlin. On my arrival I was fortunate to meet Dr. Lennox Brown, who kindly introduced me to the following prominent investigators, viz.: Professors Krause, Frankel, Gerhards, Hærtie, Webber, Cornet, and others—as a personal friend and former assistant.

I have lost no time in getting into harness; I spend from four to six hours daily in the wards of the Charité Hospital, and examine all Dr. Webber's (Dr. Koch's assistant) cases, and do microscopic work. Besides this, Dr. Webber selects one or two cases which he goes over thoroughly with me, giving the history, etc., and the changes which take place under treatment. I also attend Dr. Krause's throat clinic for a couple of hours a day.

The town is simply crazy over "Koch's method"; every thing is tuberculosis. The results so far have been satisfactory, but it is premature to speak dogmatically until time has confirmed the present favorable impression.

There is no doubt, however, that "Koch's method" is an important factor in the treatment