

For over two years we have been making these analyses as opportunity presented. Certain technical deficiencies are met with which make the accuracy of these results only comparative. The chief among these is due to the fact that as soon as tissues such as liver are minced a separation of fluid (blood and lymph) occurs. This is not the case with muscle but is to some degree true with all organs.

We have not utilized materials unless the autopsy occurred soon after death. The following brief table abstracted from a considerable number of analyses is fairly representative.

The results given in the table for cases where no conspicuous renal disease was present are the highest we have noted rather than the average figures. For example, case II, cerebral thrombosis and arterio-sclerosis, there might here have been a difference of opinion as to whether there was renal disease or not, as evidenced in the sections. With pneumonia the analyses gave usually higher results than in any other disease not associated with frank nephritis.

With cases of nephritis with nitrogen retention there is a notable accumulation of extract nitrogen in both muscle and liver tissue, which, for muscle amounts to over 50 per cent increase above the highest normal. With liver the increase is an average and not invariably to be demonstrated. Nephritis with oedema gives inconstant results although the effort was made to select cases where nitrogen retention could be excluded. This, however, appears difficult since pure chlorid retention in our experience is exceedingly uncommon; there being usually a slight tendency to retain nitrogen which is disclosed only in long continued metabolism experiments.

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**The utilization of "reactor" milk in tuberculo-medicine.**

**By C. B. FITZPATRICK.**

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We cannot in the study of tuberculosis get away from the disconcerting observation that it is the infected individual who is immune

or possessed of increased resistance to tuberculosis. Our previous works<sup>1</sup> on immunity and tuberculosis led me to endeavor to ascertain to what extent milch cows, that gave no clinical signs of tuberculosis, and yet reacted to tuberculin, could be considered immune or possessed of increased resistance. Furthermore, to ascertain if the milk and serum of such "reactors" gave evidence of possessing antibodies or other healing bodies not contained in the ordinary milk and serum of cows not infected with tuberculosis. It is occasionally observed that if a cow which has reacted to tuberculin, be allowed to live, it thrives, apparently even better than some of the non-infected members of the herd. Ten of these "reactors" which were in especially prime condition were carefully selected because they thrived, and gave the physical evidence of having withstood the natural infection, in short because they appeared to be immune or the disease arrested. The milk when injected into guinea-pigs did not produce tuberculosis. The milk was also tested by the Bordet-Gengou phenomenon for tuberculosis and gave negative reactions. The blood-serum of nine were also examined for this reaction; four were definitely negative, four gave a weak reaction, and one a decided reaction but not strong enough for diagnosis. One of these cows went dry and the milk of another was excluded because it readily killed mice in comparatively small doses, when injected subcutaneously. The serum of these cows, when added to glycerin-bouillon cultures of the tubercle bacillus did not inhibit their growth. The ten autopsies on these "reactor" cows showed slight localized lesions in the lungs, and in the bronchial and posterior mediastinal glands in nine cows and in one cow slight generalized lesions were found.

Seven moderately advanced cases of adult pulmonary tuberculosis were fed daily a quart of this "reactor" milk over a period of three months. They gained an average of nine pounds. They increased this average gain during the next two months and ten days to 16 pounds. Six controls, *i. e.*, similar cases living under like conditions were given pasteurized milk, during the same

<sup>1</sup> PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE, 1910, VII, pp. 77-79; *ibid.*, pp. 104-7; *ibid.*, VIII, pp. 24-28; *ibid.*, pp. 41-43; *ibid.*, Feb. 21, 1912, IX, pp. 49-51; *ibid.*, Feb. 19, 1913, Vol. X, No. 3, pp. 103-107; *ibid.*, Oct. 15, 1913; *ibid.*, June 6, 1914, Vol. XI, No. 6. Collected Studies 1913, Research Lab., Dept. of Health, N. Y. City, N. Y.

period. They lost an average of four pounds. They increased this average loss during the next two months and ten days to six pounds. There was no noticeable alteration in the pulmonary conditions.

All the cases took three pints of milk a day. The special cases, one quart of "reactor" milk and one pint of pasteurized milk. The controls, three pints of pasteurized milk.

The "reactor" milk contained less butter fat than the pasteurized milk. The use of this raw "reactor" milk, judging by its action upon two cases of adult pulmonary tuberculosis, is probably contraindicated in dysentery and hemorrhage. This dysentery case proved fatal. It was used in one far advanced case of adult pulmonary tuberculosis and apparently agreed with her, although her weight remained unchanged.

We mixed diphtheria antitoxine with milk for the purpose of determining by analogy if the tuberculous antibodies when present in milk, would be destroyed by pasteurization. These mixtures after having been heated were tested with toxin, in order to determine whether any destruction of antibody had taken place. We found that the antitoxine was not materially affected by heating at 60° C. for 20 minutes. Certain milks we have tested showed the presence of some natural substance or antibody which neutralized diphtheria toxine. I wish to thank Mr. E. J. Banzhaf for his aid in making these antitoxine tests.

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### **Anaphylatoxin and the mechanism of anaphylaxis.**

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Precipitin is identical with the antibody effective in passive sensitization. This is demonstrated by injecting a guinea-pig with the precipitate formed by a mixture of horse serum with the serum of a rabbit immunized thereto. This guinea-pig, if tested after an interval of three days by the intravenous injection of horse serum, presents a violent, at times a fatal anaphylactic response.