presbyopia remained the same, while his hyperopia had diminished 0.75 D. in the right eye and 1.00 D. in the left; later still both the hyperopia and the slight paresis of accommodation disappeared practically, allowing the use of the original reading lenses only (+1.75).

I venture to say that if Dr. Roberts had examined his patient under complete cycloplegia he would have no doubt in his mind as to my view of the case; for it then would have been most evident that there was a positive decrease in the refraction of the eye, with possibly a slight paresis of accommodation, followed by a return to the original condition with improvement in the patient's health.

Since coming to Los Angeles, I have been advised by telegram that Dr. Ellis has just seen an additional case of diabetes in a woman aged 40, with a sudden increase of hyperopia. The patient had been wearing +0.50 Sph. for distance, and +2.50 for reading. One week ago these lenses gave satisfactory vision. She now requires +2.00 Sph. with +0.50 Cyl. Axis horizontal for distance. Vision is 6/7, and accommodation normal for her age.

THE IMPORTANCE OF A CERTIFIED OR PASTEURIZED BUTTER*

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The title of my paper may seem somewhat out of the province of the activities of the Association of Certified Milk Commissions. However, the association has accomplished such laudable results in raising the standard of our milk-supply that it seemed only fitting that we should turn to it, in seeking a similar uplift of the standard of butter. It is indeed strange that in spite of our knowledge, the fruit of various investigations in this field, the attempts to provide a safe butter have been so feeble.

There is no need of repeating the evidence to the effect that cream contains tubercle bacilli even in larger amounts than the milk from which it is made. When the cream rises, whether it ascends by means of gravity or through the agency of centrifugal force, the fat globules carry with them a large proportion of the bacilli, which are filtered out from the underlying skim-milk into the cream and the sediment. The tubercle bacilli of the cream constitute the tubercle bacilli in the butter. It is difficult to state the percentage of contamination of the butter sold in large cities, but we probably shall not go far wide of the mark if we accept Cornet's¹ figure of 12 per cent. as an average. It has been demonstrated by Schroeder that these bacilli can maintain their virulence, in spite of the salt which the butter contains, for a period of three months. These facts naturally lead to a consideration of the subject which has been the main field of contention among those actively interested in the investigation of the cause of tuberculosis, namely, the importance of infection in man by the bovine type of tubercle bacillus, and of the alimentary tract as a portal of entry. It is not necessary in this place to discuss this question in detail. However opinions may vary on these questions, I think that almost all are now ready to accept the conclusion that the bovine bacillus constitutes a real menace to the welfare of infants and young children. The investigation in England by the British commission, the more comprehensive one in the United States by Park and Krumwiede, and that of the imperial Health Bureau of Germany force this deduction on us. So that it seems certain that in childhood, and especially in the first few years of life, bovine tuberculosis plays an important rôle.

So much for the contamination of butter by means of the tubercle bacillus. Investigations of recent years have directed us with ever-increasing frequency to the milk-supply as the source of epidemics of typhoid fever, scarlet fever, diphtheria and possibly some other of the infectious diseases. It is difficult to be precise in a discussion of scarlet fever; however, as regards typhoid fever we can adduce some interesting facts to illustrate the lesson of this article. If milk is infected with typhoid bacilli, these organisms will rise with the cream and be incorporated in the butter,² as we saw was the case with tubercle bacilli. It has, furthermore, been demonstrated by Bruck³ that typhoid bacilli can maintain their viability and virulence in butter for at least twenty-nine days, and, indeed, multiply in this medium for the first few days.

In this connection it may be well to consider some phases of this topic which bear directly on our subject. It is claimed by some that the salting of the butter and its maintenance in cold storage kill the bacteria and render it a safe product. This question must still be considered an open one, in that a precise answer as to the exact influence of these factors on butter cannot be given. The consensus of opinion, however, seems to be that the addition of from 2 to 3 per cent. of salt, which is the usual salt content of commercial butter, has but a mild inhibitory effect on bacterial life or growth, and that in spite of the salt and the temperature of zero centigrade, bacteria have been found to multiply. These experiments record the results of bacterial counts of a gram of butter, and concern themselves with the estimation of lactic acid and other saprophytic bacteria. Such figures have little value for us, as we are concerned only with the viability of pathogenic organisms, such as the typhoid bacillus. As far as I have ascertained, a thorough study of this organism in this regard has not been made.

The attitude of the community toward butter and milk may be stated as follows: The people are warned not to drink milk unless it is certified or pasteurized; that is, unless it is pure or purified, on account of the danger of tuberculosis, typhoid, and other infectious diseases. Nevertheless they are urged to partake of butter which may well have these same pathogenic bacteria, but which by our silence we seem to concede is innocuous. It may be thought that the danger is slight because the amount of butter ingested is comparatively small. But, although this no doubt mitigates the evil, it does not by any means do away with it. I have shown elsewhere⁴ that partaking daily of milk containing small numbers of tubercle bacilli may cause infection, whereas the same quantity given in one dose failed to produce tuberculosis. It should also be borne in mind that very young children, 2 years of age or younger, at a time when they are still very susceptible to infection by the bovine bacillus, consume considerable quantities of butter, and are thus exposed to infection.

When we come to consider the remedy of this evil, an evil which I realize is secondary to that of infected milk, we are met by the same difficulties and problems which beset us in the consideration of the milk problem—the ideal of a clean product which we can certify, and the practical makeshift of a safe product which we must permit. The certification of butter should impose the same requirement as the certification of milk, specifying

2. Hess: Middle Milk Mixtures, THE JOURNAL A. M. A., Aug. 14, 1909, p. 523.

3. Bruck: Deutsch. med. Wchnschr., 1903, xxvi, 460.

4. Hess: The Subsequent Health of Children Who Drank Milk Containing Tubercle Bacilli, THE JOURNAL A. M. A., May 6, 1911, p. 1322.

* Read at the annual meeting of the Association of Certified Milk Commissions, Philadelphia, May 24, 1911.
1. Cornet: Die Tuberkulose, part 1, p. 122.

besides that the butter be made under clean and sanitary conditions. The demand for certified butter could never be general, for just as the price of certified milk is prohibitive to many a householder, so it would be in the case of the butter. But there are many who, if told of the dangers of the ordinary butter, of its contamination by tubercle bacilli and possible other pathogenic organisms, would be quite ready to pay the additional price for the surety of having a safe product for their children. It would be a butter for children, just as the certified milk is primarily a milk for infants and children. Some dairy which has butter-making machinery, especially one situated at some distance from the railway and therefore handicapped in selling its product as milk, might be induced to put a certified butter on the market. In proportion to the amount of milk used in making butter, butter is less expensive than milk; in fact, this is one of the exceptional cases in which the manufactured product brings less than the raw material. I hope to see this idea carried out in the near future, and do not doubt that some one will be found to enter this field.

Although a certified butter is out of the reach of the masses at the present time, a pasteurized butter, which is the other form of safe butter, is well within their reach. It is noteworthy that in spite of the fact that so many of us realize the advantages of a pasteurized butter, that we know that it is the staple butter in some countries, for example, Denmark, and is used in many other countries, that we have not been able to create a sufficiently strong demand to force the supply of this product. I need not add that pasteurized butter has no distinctive taste, and in color, texture and other qualities is no different from unheated butter. I believe that it is high time that it be rendered possible to purchase a labeled pasteurized butter, especially for the use of children. In New York a butter of this kind will be put on the market in the near future, and will cost five cents more per pound than the raw butter. This increase in price is permissible at this time; however, I do not believe that it will be found necessary when the demand is determined and found adequate. I believe that if our young children are protected from infection through butter we shall, in a very practical and simple way, be making another step along the road of preventive medicine.

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THE DIAGNOSIS OF PANCREATIC DISEASE

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In spite of the progress made in the knowledge of the physiology of the pancreas, its diseases remain difficult and uncertain of diagnosis. The cause of this is apparent in that the clinical aspects of pancreatic disease are in most instances indefinite and not characteristic, and many of the laboratory aids have not proved efficient. My desire to test the value of the newer methods devised for diagnosis prompted some work along this line in the Klinik von Noorden, in which I was associated in the work with Docent Dr. Salomon.

The newer methods of determining the pancreas function for diagnostic purposes aim to test for the presence of the ferments in the stool. To facilitate rapid peristalsis after a breakfast of mixed food followed by an

enema, calomel 0.2 gm. and phenolphthalein 0.5 (as recommended by Muller) prove very satisfactory.

The two ferments made use of in the determination from the stool of pancreas activity are trypsin and amyl-opsin and their absence from the stool would point toward pancreas obstruction or insufficiency.

To determine the presence or absence of trypsin, the Fuld-Gross method may be used or the methods of Muller¹ and Schlecht,² which latter is as follows: The stool is rubbed up with a small quantity of glycerin to prevent evaporation, and several drops of the mixture placed in Petri plates containing Loeffler blood-serum and heated to 50-60 C. for twenty-four hours. The high temperature prevents the growth of bacteria, but not the action of the enzymes, and the presence of softening and depressions in the serum would indicate trypsin digestion, varying in degree according to the quantity of the enzyme present.

The simplicity of this method would commend its use, but already Schlecht has reported negative findings in the fat-stools of icterus, in obstipation, bloody stools and stomach carcinoma, and Komarelli has reported like observations. Frank and Schittenhelm³ contend that the *succus entericus* also contains a proteolytic ferment, which would seem to place a doubtful value on these tests for the trypsin content.

The Fuld-Gross-Goldschmidt method (reference below) requires a solution containing 1 gm. each to the liter of casein, chloroform and sodium carbonate. To 5 c.c. of this solution varying dilutions of stool filtrate are added in different test-tubes, or, in the absence of a fluid stool, 5 gm. of stool is rubbed up with 20 c.c. physiologic salt solution, centrifuged and filtered and added to the casein solution. The mixture is allowed to digest at 38 to 40 C. for twenty-four hours, and the end-result is tested by the addition of a 1 per cent. acetic acid solution, which causes a precipitate in the tubes, when digestion is incomplete. The Fuld-Gross method proved very satisfactory in our work in the hospital and was carried out at the same time as the Wohlgemuth⁴ method for anylopsin. The method of Wohlgemuth requires a 1 per cent. solution (Kahlbaum's soluble starch), which is best prepared on a water bath for eight to ten minutes with considerable stirring. Similar dilutions of stool filtrate as in the Fuld-Gross method are added to 5 c.c. of the starch solution in test-tubes, toluol added and the whole digested for twenty-four hours at from 38 to 40 C. At the end of this time the test-tubes are filled to near the top with tap-water, one drop of tenth-normal iodine solution is added to each tube, and a blue color no longer appears in the tube when the starch has been entirely digested. The dilution of stool used for both the trypsin and amyl-opsin tests are the same and are made with physiologic salt solution. In dilutions of 1 to 10, 1 to 100, 1 to 1,000 they are sufficient for all purposes. Of each of these dilutions it is best to take 2 c.c., 1 c.c. and 0.5 c.c., which are added to the tubes containing either casein or starch. The quantitative estimation of the ferment content is reckoned from the tube containing the greatest dilution, which has still been able to transform the starch or casein. The estimation is made in units, one unit representing the ability of 1 c.c. stool filtrate to transform 1 c.c. starch or casein solution. Suppose that the tube containing 1 c.c. of the 1 to 1,000 dilution is the greatest dilution which can transform 5

1. Deutsch. Arch. f. klin. Med., 1907, xcl: 1908, xcii.

2. München. med. Wchnschr., 1908, p. 725.

3. Zentralbl. f. d. ges. Physiol. u. Path. d. Stoffwechs., 1909, p. 881.

4. Biochem. Ztschr., 1909, xxi