

which we find a history of attacks, similar to those described by the doctor in his paper, occurring as a precursor of epilepsy. In fact, as a result of a careful study of this subject I am convinced that the brain lesions causing infantile cerebral palsies may be ranked as one of the most important and frequent causes of epilepsy.

DR. SANGER BROWN, Chicago: It is a little doubtful whether these cases admit properly of a classification that would enable them all to be discussed together. According to the essayists the diphtheritic paralysis and encephalitis are adduced as the cause of the hemiplegia. I think the pathology of diphtheritic paralysis is pretty well defined to be a peripheral paralysis, and due to the effect of the toxin of diphtheria acting on the peripheral motor neurons, some being more sensitive than others, but in severe cases all being affected. There are various evidences, such as the usual impairment or loss of the reflexes in the parts concerned. Now I do not think in either of the two cases referred to by the essayists, even though signs of diphtheritic paralysis appeared before hemiplegia, that is, in the paralysis of the palate, or in the power of convergence, or the pupillary condition, even though that had occurred, and afterward hemiplegia occurred, it would be proper to regard the hemiplegia as being caused by the diphtheritic paralysis. It would be, I think, fair to assume that it was due to the general infection, as it might occur in any of the infectious diseases, and as Dr. Sachs has pointed out, or contended for very ably, the hemiplegia would be due to a vascular disturbance, due to the infectious disease, and not to the toxin acting on the peripheral neurons. I would strongly take the view that these two conditions were merely coincident, and I do not think it would be at all proper to regard the hemiplegia as a form of diphtheritic paralysis. Now, I think each case should be considered separately. The only other point that struck me was in the case of the child with the paralytic and sensory attacks in which there was no fever. The symptoms were described, and from the subsequent history I should strongly suspect interstitial sclerosis.

DR. L. H. METTLER, Chicago: I would like to ask Dr. Perry or Dr. Hamilton how they differentiate, aside from the mere difference in location, between the pathology of acute hemorrhagic encephalitis and acute hemorrhagic anterior poliomyelitis. The theory propounded by Strümpell, wherein he classified certain forms of infantile encephalitis, nuclear inflammation, and anterior poliomyelitis as one and the same pathological process, differing only clinically by reason of the different localization of the lesion—a functional more than a pathologic differentiation—has always been more popular in Europe than in America. If Strümpell's condition is the true one, it seems to me that it offers us a distinct advantage in the practical consideration of these affections. Clinical differentiations between diseases, along easily observed lines of function, render the diagnosis and management of diseases easier and more accurate than when those differentiations depend on minute post-mortem pathologic findings. I, for one, would like to be more minutely informed on this matter. As I feel now, it is not the nature of the lesion so much as it is the location of it, that marks the distinction between these inflammatory troubles of the central nervous system, especially its gray matter. I think Starr takes emphatically the same position in his recent work on diseases of the nervous system. If these infantile palsies, cerebral, nuclear, and spinal, are absolutely distinct and dissimilar disease processes, I think the differences, apart from mere location of the lesion, ought to be brought out more clearly by our teachers of pathology. Sarcoma of the brain and sarcoma of the cord are not regarded as essentially different diseases.

In this connection, while speaking of localization differences being made the basis of nosology in the absence of any real pathologic differences, I desire to speak of another matter not wholly irrelevant to the subject of the paper. Until the present time we have been talking a great deal about multiple neuritis, of the alcoholic and infectious types, as though it were a distinct, unique, and *sui generis* disease-process. Many pathologists now, however, are modifying their views, and are inclining to adopt more and more the teachings of Charcot, for which he long ago contended so earnestly and for which he

received so much adverse criticism, namely, that these alcoholic intoxications and infections, when studied under the guise of multiple neuritis, represented mere localization differentiations and not essential diseases. Other organs were always more or less also involved, and the alcoholism or infection was the essential basis on which the cases in practice were to be classified. Present investigations show that in alcoholic polyneuritis, for instance, the degenerative process may be traced up through the nervous system to the very cortex. I cite this as a parallel instance somewhat to the question in hand, and to point out that we must not be too narrow in our conceptions of disease. We must be careful not to refer to clinical manifestations, which represent merely a functional localization, as special diseases.

Therefore, I would like to be informed wherein pathologically, not functionally, hemorrhagic polioencephalitis differs so much from hemorrhagic poliomyelitis as to warrant the consideration of these two maladies as wholly distinct and separate diseases. It is the end and aim of all science to generalize, if possible, to reduce to small groups many related phenomena, and to harmonize apparent discrepancies. It certainly is not the end and aim of science to merely enumerate a vast mass of minute and particular observations that may be closely interrelated.

DR. W. A. JONES, Minneapolis: The object of this paper was to provoke a discussion as to the influence and effect of infections on the central nervous system. The description of the three supposedly diphtheritic cases means that infection is not only peripheral, but of central origin, and not infrequently destructive or inflammatory lesions are found in these so-called peripheral paralyses. If encephalitis and poliomyelitis are due to infections, I do not see how we can differentiate between these various diseases and their onset.

The two last cases reported, to my mind, are the most important, because they both show a central localized infective and inflammatory process in the cortex, and both cases, which were operated, seemed to confirm the work of Dr. Southard.

The third case, that of the child, was particularly interesting, but we were not able to determine the beginning of the infective process. The lesion was a characteristic one, if we can judge from gross appearances, and the inflammation involved mainly the cortex and did not extend into the white substance extensively. She made a prompt recovery from her peculiar epileptiform attacks and practically complete recovery from the hemiplegia following operation. The character of the epileptiform attacks in the third and fourth cases was distinctive in that the attacks were sudden, violent, repeated muscular contractions without paralysis between the seizures; that they were irritative and cortical I think is undisputed, particularly with our findings.

TUBERCULOSIS IN MARKET MILK OF CHICAGO *

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During the summer of 1909, a series of examinations of market milk was undertaken in Chicago, at the instigation of the Commissioner of Health, Dr. W. A. Evans. Several similar investigations have been reported in other localities in the United States during the past two years, the results of which bring out clearly the high incidence of tubercle bacilli in milk-supplies and the consequent importance of milk control from the standpoint of public health. It is believed that the results herein recorded, inasmuch as they give insight into the milk situation of one of the large municipalities of the country, will be of interest as adding to the general fund of knowledge on the subject.

* Read in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-first Annual Session, held at St. Louis, June, 1910.

The work was undertaken during the months of July and August, 1909, and carried out partly in the Bacteriological Department of the University of Chicago under the direction of Dr. P. G. Heineman of that institution, and partly in the Municipal Laboratory of the Department of Health, City of Chicago. The results of the work in both laboratories will be reported jointly, in order that from the larger number of samples thus available for study a more accurate idea of the extent to which the general supply was effected may be obtained. In addition to the reporting of results, it is my purpose to discuss briefly a few of the considerations which naturally arise in connection with the choice of the remedy to be applied.

The samples were collected by health department inspectors, and were brought in partly in original containers and partly in sterilized bottles furnished by the Municipal Laboratory. The effort was made, as far as possible, to deliver the samples to one of the laboratories within a few hours of the time of collection. It was arranged that the dairy inspectors working in the neighboring country districts should submit samples from the country shippers to the Municipal Laboratory. In addition, a milk inspector was detailed within the city limits for collection of market samples from depots, stores, wagons, etc., with the idea of covering, in as representative a manner as possible, all types of places in which milk is sold in Chicago. Samples collected within the city limits were delivered to the Bacteriologic Laboratory of the University of Chicago.

The technic employed in the laboratory at the University of Chicago was as follows: Three hundred c.c. of the sample were centrifugalized for thirty minutes at a speed of about 1,200 revolutions per minute. The layer between the cream and the sediment was then removed by means of a sterile pipette and the sediment and cream thoroughly mixed. This mixture was diluted with sterile saline solution to an amount sufficient for the injection of three guinea-pigs, using from 1 c.c. to 2 c.c. for each injection. All inoculations were made subcutaneously in the abdominal wall, the syringe being cleaned and sterilized by heat after the injection of each specimen of milk. The pigs were kept in clean cages and observed for a period of three months. Animals showing glands at the end of six weeks were separated from the others. Tuberculosis was determined by the gross lesions and by smears prepared from the affected organs. The same general method was followed at the Municipal Laboratory of the health department with no essential differences in detail, except that one animal instead of three was used for each specimen. In the Municipal Laboratory the gross autopsy findings were confirmed by demonstration of the tubercle bacilli in stained sections of the organs, the slides of which are now on file in the health department. It is to be noted, however, that, inasmuch as the clinically negative animals were not subjected to autopsy, but in both laboratories were allowed to live and be used for other purposes, the results of the series must be reported as minimum findings only. No cultural studies were attempted to determine the presence of human and bovine types of the organism.

From a strictly scientific point of view, it is to be regretted that cultures were not made from the organs to exclude the possible presence of Rabinovitch butter bacillus. It so happened that the autopsies fell due at a time when the laboratories were flooded with other work, and therefore it was necessary to omit this detail for lack of available time. Practically, however, it is

our belief that the positive findings here reported may be considered tuberculosis. The autopsies were in every case well marked and typical, and the findings agree well with the results of observers in other cities in the United States.

Incidentally in connection with the autopsy of the animals, it was decided to mount a few of the guinea-pigs by the Kaiserling method for purposes of exhibition. The value of such exhibits in the fight for purer milk soon became evident, and I believe, should not pass without mention, inasmuch as the suggestion may be of use to others who may contemplate the institution of a similar educational campaign. In the conduct of such a campaign, it is very necessary to have at one's command arguments which are convincing to laymen, many of whom are still doubtful as to the existence of bacteria, and most of whom find it difficult to understand how milk, which is perfectly sweet and pure to all appearances, may still be unfit for use and dangerous to health. In this connection it is hard to conceive of a more concrete object-lesson for the milk-dealer or legislator than to present for his inspection a guinea-pig which has been killed by the milk he is feeding to his children. A normal guinea-pig should also be mounted for comparison, in order that the marks of the disease in the tuberculous specimens may be clearly apparent to any observer.

The total number of milk samples examined in the two laboratories was 163. Of these, fifty-one caused the death of all the animals injected from acute infections within three weeks, before diagnosis of tuberculosis was possible. Eliminating these as lost, there remain one hundred and twelve available for the series, of which ten, or 8.9 per cent., proved tuberculous. Of 144 samples of raw milk, forty-nine were lost within three weeks, leaving ninety-six available for consideration. Of these, ten specimens, or 10.5 per cent. were found tuberculous. Of nineteen pasteurized samples, two were eliminated, leaving seventeen for consideration. None of the pasteurized samples caused tuberculosis in the animals injected.

	No. Samples.	All Animals Died in Three Weeks.	Avail- able for Series	Per Cent. Found Tuberculous.
Total	163	51	112	8.9
Raw	144	49	95	10.5
Pasteurized	19	2	17	0

With regard to results of other observers, up to the year 1908, a very complete report has been published by Trask¹ of the U. S. Public Health and Marine-Hospital Service, covering chiefly the work of European experimenters. More recently the results of several American observers have been added to the list. Hess,² in 1909, examined 107 samples of market milk in New York City with the result that seventeen, or 16 per cent., were found to contain tubercle bacilli; Anderson³ examined 223 samples taken in the city of Washington and reported sixteen, or 6.72 per cent., as positive. Mohler⁴ has examined seventy-three samples with positive findings in two cases, or 2.7 per cent. The Bureau of Animal Industry⁵ reports two positive out of thirty-six examined, or 7.7 per cent. Goler⁶ reports about 5 per cent. of the milk-supply of Rochester, N. Y., infected,

1. Trask, J. W.: Milk and Its Relation to Infectious Diseases, THE JOURNAL A. M. A., Oct. 31, 1908, p. 1491.

2. Hess, A. F.: The Incidence of Tubercle Bacilli in New York City Milk, THE JOURNAL A. M. A., March 27, 1909, p. 1011.

3. Anderson: Jour. Infect. Dis., 1908, v. No. 2, p. 107.

4. Mohler: Bull. Hyg. Lab., U. S. P. H. and M.-H. S., No. 41, p. 493.

5. Hyg. Lab., U. S. P. H. and M.-H. S., No. 56, p. 551.

6. Goler: Jour. Am. Pub. Health Assn., 1910, xx, 95.

but does not state the number of samples examined. The incidence of tubercle bacilli in the milk-supplies of American cities, as far as obtainable, is therefore represented by the following figures, which include the results reported in this paper: Total number of samples examined, 551; total found positive, forty-six; per cent. positive, 8.3.

Without entering into the question of the relative prevalence in human subjects of the human and bovine types of infection, which has been extensively discussed in recent literature,⁷ I believe it is safe to say that the problem of tuberculosis in milk-supplies is of sufficient importance to warrant immediate steps for its eradication. Obviously it is desirable and in many instances has been proved practicable to eliminate tuberculous animals from dairy herds by means of the tuberculin test, followed by strict isolation or slaughter of the reacting animals, but this process requires time and also strict legislative support. The difficulties of its accomplishment increase enormously with the size of the community affected and the extent of the dairy districts involved. It has not as yet been proved practical in connection with milk-supplies of large municipalities. But granting its desirability and practicability, it is obvious that the public is entitled to protection during the interim required for obtaining the necessary legislation and enforcing such measures when obtained, both of which must necessarily be slow processes. Briefly stated, there is need of immediate protection of milk-supplies, while the more ideal, but necessarily slowly operating measures are being carried out. Such an immediate safeguard is to be had in compulsory pasteurization.

In Chicago the situation is being met in the following manner: The ordinance of Jan. 1, 1909, provides that all milk sold in Chicago, beginning Jan. 1, 1914, shall be obtained from tuberculin-tested cows. During the interim of five years between Jan. 1, 1909, and January 1, 1914, milk not obtained from tuberculin-tested cows may be sold, provided the said milk is pasteurized according to the rules and regulations of the department of health. Under this ordinance about 54 per cent. of the milk sold in Chicago is now pasteurized and 24 per cent. is tuberculin tested. Before the close of the present season, if existing plans are carried out, the remaining 22 per cent. will be pasteurized, and also much of the tuberculin tested product will be pasteurized. During the summer of 1909, when about 30 per cent. only of the milk was pasteurized, strict enforcement of the ordinance being at that time impossible because of administrative difficulties involved, a decrease of 521 was noted in the deaths reported among children under one year from diarrheal diseases. The average bacterial count of raw milk in 1909 was 5,547,502 per c.c.; of pasteurized samples taken from plants, less than 200,000; of pasteurized samples taken from all sources including the output of plants not yet under satisfactory control, and also street samples, many of which had been kept in stores over night, was 944,000 per cubic centimeter. Results in 1910, so far as obtainable, show a greater difference in favor of pasteurized milk, and seem to indicate that the control of pasteurization is becoming more effective. There is still the problem of preventing the practice prevailing in some retail establishments of selling left-over samples from the previous day's delivery. In my opinion this one detail is responsible for

most of the high counts obtained in pasteurized milk and tends to hold the average bacterial counts far above what they would otherwise be. The correction of this error is the next important problem which must be undertaken in the control of the situation.

It may be well to add a word as to the special applicability of pasteurization as an immediate safeguard to the milk-supplies of large cities. That it is effective in the prevention of milk-borne tuberculosis is fully conceded, but the milk situation in large cities involves so many other factors that tuberculosis of necessity comes to be regarded as only one among many sources of danger, several of which are more important from a public health standpoint. In a large city there must always be present the element of distance between the producer and consumer. Contingent on this necessary condition are the thousand and one sources of contamination occurring as a result of multiplicity of handling, time consumed in transit, improper cooling during transit, etc., all of which factors tend to multiply enormously the common polluting agencies to which milk is subject. The final product, which reaches the consumer, may therefore be dangerous from the standpoint of five or six groups of diseases, of which tuberculosis is probably not the most important. In order of their importance I should enumerate these as follows: First, and by far the most deserving of attention, is the group of infantile diarrheal diseases, which are responsible for about one-third of the death-rate among children under 2 years in our large cities. As to the bacteriology of these conditions we have little satisfactory knowledge, but the evidence furnished by vital statistics is convincing in establishing the important relation of milk thereto. Second is typhoid fever, the relation of which to milk-supplies is now well understood. Third in rank is tuberculosis. Fourth is scarlet fever. Fifth is diphtheria. Sixth is a group of miscellaneous affections not particularly important in this country, such as cholera, foot-and-mouth disease, milk-sickness and others.

As tuberculosis may be eradicated by strict application of the tuberculin test, so may these other infections be eradicated by the strict observance of sanitary rules in the production and handling of milk. But the enforcement of such observance, as in the case of elimination of tuberculosis from herds, is a time-consuming proposition, involving an educational campaign and the development of an adequate inspection system. The public is entitled to immediate protection, while the process is going on, and for this immediate protection we must turn again to pasteurization. There is certainly no one other agency of purification of milk-supplies which is of such wide applicability. That compulsory pasteurization is practicable for towns and cities under proper supervision by health authorities will, I think, soon be established and generally recognized from the experience of the City of Chicago during the past eighteen months.

ABSTRACT OF DISCUSSION

DR. F. O. TONNEY, Chicago: In reply to a question that has been asked: The bacterial counts here reported were all made on plates which had been incubated at 20 degrees C. for five days. As has been pointed out by Dr. P. G. Heinemann of the University of Chicago in a recent publication, this method gives higher bacterial counts in milk than does the method more commonly used in which the temperature of incubation is 37 C. and the time of incubation 48 hours. For

7. An excellent summary by Moss: Bull. Johns Hopkins Hosp., February, 1909, xx, No. 215; Park: Tuberculosis Congress, Washington, D. C., 1910.

this reason the count of 200,000 probably represents a higher result than would have been obtained by the less rigorous method in more general use. The figure of 200,000 per c.c. represents an average of all plants inspected, and of course includes counts made on the product of pasteurizing plants not yet under satisfactory control, the purpose of the inspection being primarily to correct any errors noted in the management of the establishment.

I think, therefore, bearing in mind the two points above mentioned, that we may consider 200,000 per c.c. a very good figure, especially in view of the great difficulty involved in the enforcement of such an ordinance so soon after its passage. I do not wish to be interpreted as saying that a bacterial count of 200,000 per c.c. on an individual sample indicates a safe product, but I believe that this figure, representing as it does an average on samples from all plants both good and bad, is a satisfactory figure for the first year of the life of the ordinance. Probably the average for the second year will show improvement.

Dr. W. A. EVANS, Chicago: There is but one way to answer that question; and that is, that 200,000 at the pasteurizer's side is not a satisfactory bacterial count. The usual bacterial count at the pasteurizer's side was around say a thousand—somewhere in there. A great many pasteurizers just started up last summer; and some of them run high. You see how one of them that would run quite high, would pull up the average. Whatever method of counting was employed, 200,000 would be an unsatisfactory count.

PATHOLOGY AND TREATMENT OF ALVEOLAR ABSCESS

AND A PLASTIC OPERATION TO CLOSE NASO-ORAL FISTULA AND A NEW OPERATION FOR MANDIBULAR NECROSIS *

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The capital operation of dentistry is devitalizing pulp and filling of the root canals, as an abdominal section or the opening of an important joint is the capital operation of surgery.

If the peritoneal cavity or synovial membrane is infected during an operation, serious and dangerous inflammatory processes follow; infections of the former in many instances result in death, and infections of the latter result in ankylosis and even amputation. It is

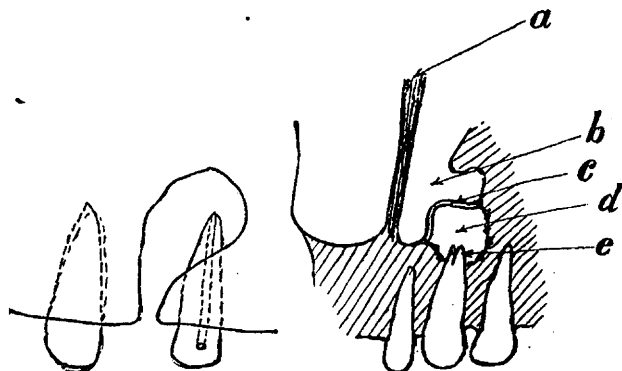


Fig. 1.—The most common alveolar fistula of the maxilla. Usually persists for years until the tooth is extracted.

Fig. 2.—This represents the method of establishment of naso-oral fistula; a, nasal septum; b, nasal cavity; c, membranous floor; d, abscess cavity; e, denuded root of tooth.

possible for the general surgeon to perform the operations without mortality only because of the great care exercised by him preparatory to and during the opera-

* Read in the Section on Stomatology of the American Medical Association, at the Sixty-first Annual Session, at St. Louis, June, 1910.

tion. On the other hand, the most delicate operation in dentistry, requiring the most technical skill as well as demanding perfect asepsis in its practice, is the devitalizing and extracting of pulps and filling these cavities. If infection occurs on account of carelessness on the part of the dentist, the too common alveolar abscess is the result. Alveolar abscess, or the so-called pus sac so frequently found on the apex of a tooth after extraction, is the forerunner of 90 per cent. of all the destructive diseases of the maxillary bones.

SERIOUS CONSEQUENCES OF ALVEOLAR ABSCESS

The pathologic changes which occur in the so-called alveolar abscess begin at the apex of the root of a tooth. The first change is quite small, beginning in the form of

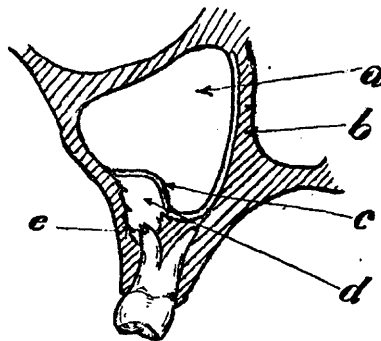


Fig. 3.—Abscess; a, antral cavity; b, naso-antral septum; c, membranous floor of the antrum; d, abscess cavity ready to rupture into the antrum; e, root of tooth denuded and cause of disease.

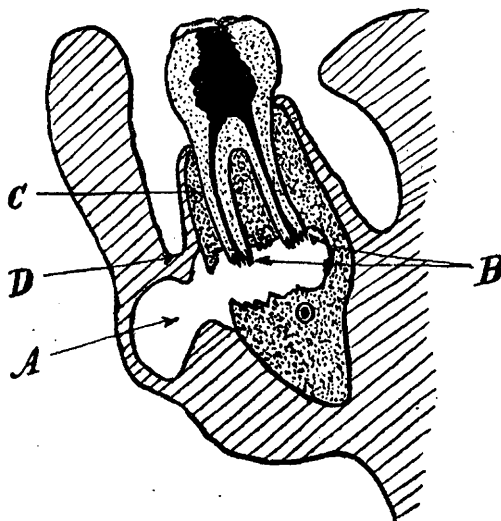


Fig. 4.—Alveolar abscess of the mandible; A, abscess cavity; B, roots of tooth; C, external alveolar plate to be removed with tooth; D, point of incision.

an infiltrate, which later liquefies. This change involves the tissues immediately around the apex of the root either destroying or promoting the absorption of the bone. The process of the destruction is in the direction of the least resistance from the root involved, which experience demonstrates to be smaller on the buccal side of the alveolar process. The destruction continues to the surface of the bone when the external manifestation of the abscess is present, namely, a fluctuating tumefaction on the external surface of the bone. This continues to destroy tissue in proportion to its activity, which depends on the variety of germ responsible for the disease.