can not be distinguished from tubercles by the microscopic anatomy. Even typical caseation appears to occur. It has been noted that the adult forms of the *Oidium coccidioides* occur mostly in the less acute lesions, while the abscesses contain numerous sporulating and occasional budding forms. The spores appear to attract leucocytes which have been seen to enter the capsules (Ophüls).

On injection into the abdominal cavity of guinea-pigs the organisms from Cases 6 and 8 gave rise to caseous inflammation of the tunica vaginalis with scrotal swelling—a point worthy of consideration in working with material suspected of containing *B. mallei*.

SUMMARY.

Systemic blastomycosis and coccidioidal granuloma are caused by closely related varieties of organisms that Ricketts and Ophüls would place with the oidia. Culturally, these organisms may resemble one another very closely. In the tissues of the infected animal or human being in which both exist as spherical bodies, they present this striking difference: that the organisms of blastomycosis multiply almost wholly by budding, while those of coccidioidal granuloma multiply essentially by endogenous sporulation. Neither forms mycelium in the animal body.

Systemic blastomycosis and coccidioidal granuloma resemble each other in many respects, both clinically and anatomically, but at the same time there are certain well-marked differences of which the following appear to be constant and distinctive: 1. The nodular lesions of coccidioidal granuloma bear a closer resemblance to the typical, specific tubercle than the nodules of blastomycosis. 2. In coccidioidal granuloma there is marked tendency to involvement of the lymph nodes, in blastomycosis slight. 3. As already stated in coccidioidal granuloma the organisms multiply by endogenous sporulation in blastomycosis by budding.

Nothing is yet known concerning the conditions that lead to natural infection with either of these diseases, but human beings once infected appear susceptible and the apparent infrequency of the diseases may be explainable by assuming that as yet the occasion necessary for infection is infrequent.

MUNICIPAL REGULATION OF THE MILK SUPPLY.*

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"We can't do too much to help them. The future of this country depends on its poor children. If they are to do right, they must be saved from ill health, and ignorance and vice; and the first step is to give them good food and air so that they shall have strong little bodies."—PAUL LEICESTER FORD, in "The Honorable Peter Stirling."

If we take this statement at its worth, it means that the food of a child determines the future of the citizen and the physical strength of the potential fathers and mothers of the state. In guarding the milk supply we are not then confronted solely with the question of infantile sickness and death, with possible outbreaks of infectious disease through milk, but with a far larger problem, one of the greatest of social problems, that of the future of the race.

The first duty of man is to be a good animal. To be a good animal he must be well housed, well clothed and well nourished. In his duty to the state can he do less than to house, clothe and feed his children? Ought not the state do all in its power to aid the man in selecting shelter, clothing and food for his family, so that the wants of the many may not be exploited for the benefit of the few?

We are here to consider the ways and means by which the municipality, a political division of the state, may best protect the food of the infant. Milk is, of necessity, the sole food of the infant during the first and most important months of life, and it is to secure the municipal regulation of this food supply, by surrounding it with every possible safeguard, that we must address ourselves, both for the baby and for the state, both now and for the future.

This milk that the baby must have is the article of food that requires more care in its production and handling, and consequently more care in its supervision, than any other food. All through the many steps of production and handling this food supply of the baby must be protected. Not until the baby's milk has entered the baby's stomach must our vigilance be relaxed. For milk is unlike other foods; if once it is dirty it can not be cleansed. Most other foods may be heated without impairing their digestibility. Milk can not be so treated. Preservatives may be added to other foods without great harm to the adult. Who would permit the addition of preservatives to milk for the baby? Milk may be contaminated by the organisms of infectious diseases, diphtheria, scarlet fever, typhoid fever, tuberculosis, by any of the colon group and other allied organisms. Shall we by heat or by mechanical means chance the removal of part of the contaminating material, or shall we for the sake of the baby prevent these poisons from gaining access to milk? Other foods than milk may be kept at room temperature for long periods of time without change, cooked without change, subjected to mechanical operations without change, but it is not so with milk that is to be used as food for the baby.

We establish children's hospitals, we employ physicians to cure children affected by the diarrheal diseases of dirty milk, and at great expense we build and equip sanatoria for the treatment of men, women and children affected by the great white plague, and we permit the sale of dirty warm milk from filthy tubercular cattle, while the boards of managers of the children's hospitals and tubercular sanatoria cry out for more beds. Has not the time arrived when we may spend some more of our funds in preventing diseases, in educating the dairyman to produce clean milk, the public to demand and to pay for clean milk, and to insist that the tubercular cow be weeded out and its place taken by the clean, well-kept, disease-free cow?

If milk is so important as a food for the baby, are we not justified in protecting it from contamination? Is not the state warranted in adopting the most stringent rules and enforcing them to the extent of the law? In its extremity is there anything the state ought not to do, even to owning and thus controlling the milk supply, should such a measure be necessary to protect the food of the babies? Unless we do protect our children's food, we may some time find that, instead of strong men, we have a race of Houligans.

I think it is unnecessary to say more about the need of protecting the municipal milk supply, but before

* Read in the Section on Hygiene and Sanitary Science of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

taking up the question of its protection let us try to get the milkman's view.

Of the several millions of milk cows kept in this country, 50 per cent. are said to be kept at a loss, 25 per cent. return no profit, and only 25 per cent. are profitable to their owners. The business of milk production and distribution is not generally, save by the large concerns, conducted in a systematic manner. However practical the men engaged in the work may be, they are not scientifically trained in the different steps of tillage, planting, storing, feeding, nor in properly housing and caring for cattle, nor in handling and transporting milk. These men are all engaged in handling the most perishable of foods; the only one that does not rise and fall in price with the demand for it and with the cost of its production. Already most of the producers and retailers have done more than they have been paid for by the public in improving the conditions of their premises, their cattle and their utensils.

Then, men in the milk business work every day in the year, in the heat and in the cold, on Sundays and holidays. The demands of the public compel work and delivery at early and unusual hours, so that fresh (?) milk may be delivered for breakfast. We should consider these things in our discussion.

How can the municipality regulate the milk supply? It can pass and enforce milk ordinances. These municipal ordinances should provide that: Milk must be drawn from healthy, tuberculin-tested cows, well fed, watered and housed, having at least 600 feet of space and ample ventilation in well-lighted, airy barns. They must be cared for by daily grooming. They must have daily exercise in protected enclosures. The long hairs on the bellies, tails and udders must be kept clipped short. Before milking the udders must be cleansed with clean cloths by men whose hands are clean and who are unaffected by communicable disease. Feeding must take place after milking. In handling the milk it must be put into well-constructed, well-tinned, clean cans that have been sterilized by the retailer by exposing them to steam for at least one hour and afterward kept closed. The milking utensils, pails, strainers, coolers, must, after each milking, be washed by the producer and boiled in the milk room; never in the dwelling house. They must be covered and protected from dust until ready to receive the milk. Milking must be done in visored pails or by machine, and the milk carried directly from the barn to a clean, cement-floored milkhouse and poured into cans over a cooler protected from exposure to dust. The cans must be covered and cooled until ready for shipment in refrigerator cars, and must there be maintained at 45 degrees F., and must not be over 50 degrees F. on delivery to the consumer. Bottles used for milk must be sterilized in the same manner as the cans, filled in no other place but the milkhouse or city dairy, and used for no other purpose than milk containers under penalty of imprisonment. On bottled milk the cap must be secured by a paster covering it on which the kind of milk, "certified" or "inspected," must be printed in Gothic type not less than an inch high.

The whole milk must have the state standard of fat and solids, must not be watered nor have any of the cream removed unless distinctly labeled "skim milk" in Gothic letters, for cans, three inches high, and for bottles, one inch high. Milk must not be submitted to any mechanical or heating process and must contain no more than 100,000 bacteria per c.c. for inspected milk. Provision must be made for its sale from clean wagons.

When kept in shops it must be stored in clean refrigerators, and must be sold by people having clean persons and clean clothes. Provision must be made for infants' milk depots in charge of trained nurses at least during the summer months, and such depots must be established in connection with stores where the cleanliness of place and person shall approach those of a model milk shop.

Then the municipality must provide for the inspection and enforcement of its milk ordinances by the following rules:

1. There must be a sufficient number of inspectors really to inspect, and through such inspections to determine that the applicant for the holder of a license is qualified to produce and distribute milk. To such an one only should a milk license be issued.

That adequate inspection may be made, a sufficient number of inspectors must be employed to collect:

- a. From each wagon at least one monthly sample for bacteriologic and chemical examination.
- b. At least once in two months a sample from each store offering milk for sale.

Every city dairy and every store to be scored at least quarterly by the inspector on a score card after the plan of those used by the U. S. Department of Agriculture and the Dairy Department at Cornell University.

2. There must be daily inspection of the incoming milk at each railroad station for:

- a. Condition of and housing of cans and bottles of milk in shipment.
- b. Condition of empty cans reshipped.
- c. Temperature of milk.
- d. Inspection of railroad samples to guard the retailers against fraud on the part of the wholesalers.

The written reports on score cards must be returned to the chief milk inspector, who reports directly to the head of the department.

Thus the city provides for the bacteriologic and chemical examination of the milk supply, wagon and store inspection and daily inspections at the railroad stations.

From such reports could be obtained sufficient data to enable the chief milk inspector to determine rapidly those who are violating the milk ordinances, and to enable the head of the department to promptly lay information against those dealers in milk who are violating the milk ordinance. For the first offense a fine should be imposed; for the second offense, the law should make imprisonment the punishment without alternative, and the man convicted the second time should not be permitted to enter or engage in the milk business again.

So much for the city end of milk inspection. The country end of the work is of equal, if not greater, importance.

3. The territory from which the city draws its milk supply must be mapped, the dairies plotted, the roads examined, the railroad facilities noted, and routes laid so that every farm shipping milk to the city may in the beginning be subjected to a systematic inspection once in two months. No milk must be permitted to enter the city until the seal of inspection has been placed on it by the inspector.

For larger cities drawing milk from a district too extensive to be inspected from a single center within the city, one or more places are to be determined as substations of inspection, each substation so designated to be placed in charge of an assistant chief inspector, with a sufficient force to cover the ground within his territory by monthly inspections. Each substation must have a laboratory equipment for both chemical and bacteriologic examinations, and to it the inspectors for

the district must bring samples of milk for chemical and bacteriologic examinations. To the officer in charge of the laboratory they must furnish reports on score cards of all the dairies within their jurisdiction. These reports must be furnished in quadruplicate, one to be left with the dairyman, one to be mailed to the retailer, one for filing at the substation, and one to be filed at the central office.

When such a laboratory is established, the inspectors must be given to understand that they are not altogether a police force, though having certain police powers. While their duty is that of protecting the milk supply of the city, they can best serve the interests of the city by teaching cleanliness in the production and handling of milk, the necessity for and rigid enforcement of an annual tuberculin test, for reporting and demanding the isolating of cases of infectious disease in the family of the dairyman and among his cattle, and also to guard against the introduction into the herd of animals untested by the tuberculin test. To every milk producer they must furnish illustrated booklets, where in the simplest language all the essentials of milk production and handling must be clearly set forth.

Near every small city, and in connection with the substations of every large city, there should ultimately be provision for a small experimental farm cultivated on the most intensive plan. At such a farm all the operations of dairy farming should be carried out for the benefit of the dairyman. These should include the preparation of the soil, drainage, tillage, preparation and selection of seed, planting, cultivation, harvesting, storing of grasses and grains, silos and silage, housing and care of cattle, milking, care of utensils, storage and shipment of milk, etc., all carried out on a small scale after the latest and most approved methods. This work ought to be done on a small old place, a somewhat run-down place being good for the beginning experiment, so that the farmer might actually see or learn by the records how the drainage and fertility of land had been increased. On such an old place, partly rebuilt, the farmer might learn how he could readapt his own premises to the needs of modern dairying if the state would but point the way.

If the municipality desires to exhibit a fine plant, let it establish such a plant in one of the city parks. Dr. Joseph Roby, of the Rochester Health Bureau, has suggested in a former paper that such a dairy plant might be established in connection with the park system of a city. In such a plant not only all advanced dairy operations might be carried out, but a day nursery with trained nurses in attendance could be established for babies, who on visiting the parks might be able to secure clean milk at cost, and where the mothers or nurses might see all the operations of advanced dairying, and so learn to demand cleaner milk for house delivery. We believe, however, that the plant in the country on a small farm, with old buildings that may be adapted by a small expenditure of money to the work of milk production, is most important. An expensive plant with new buildings would not appeal to the great army of small producers, and at present the small producer is the man on whom the city must depend for its milk supply. The problem for us is to show the small producer, the large producer and the dairyman, as well, how to produce clean milk at a profit without an expensive plant.

If the state will only establish an experimental dairy, a fund might be furnished through private philanthropy

to assist a few dairymen in starting the work of producing clean milk. Not only men, but women, especially trained nurses with a desire for country life, might find here an occupation for which their work and training in the hospitals would help to fit them. This plan is, of course, largely tentative, but it is so important to the infant, the parent and to the state that the old unscientific way of producing market milk must give place to the newer and more scientific way of doing the work. Men endow chairs in universities, build and equip libraries, endow expeditions for astronomical, geological and geographical researches into remote regions and do many other things for the benefit of their fellows that involve the expenditure of thousands, even millions, of dollars. All this expenditure of vast sums of money is for teaching or for research. A few thousand dollars spent in aiding the establishment of demonstration dairies in public parks and on the outskirts of cities would do more for people than libraries or north pole research. It would help the work of the agricultural experiment station, help the farmer and the dairyman, and, with the assistance of the work of municipal milk stations, help to furnish clean milk for the babies that are to become the citizens of the future.

THE METHODS OF DEALING WITH THE MILK SUPPLY OF NEW YORK CITY.*

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NEW YORK CITY.

Among the questions dealt with by sanitary authorities there is no other of greater importance than the one concerning the production and distribution of a supply of pure, clean milk. Many of the features of the vast question of food adulteration are being met by our national government in its regulation of interstate commerce. Of necessity, however, these laws can control the transportation only of the less perishable articles of food, and the responsibility of the milk supply of a community must be left almost entirely to the local authorities. From the time when each family kept its own cow or depended for its supply of milk on a local farmer, to the present situation, when the big cities depend on a supply drawn from thousands of dairies scattered over wide areas, is a far cry.

This change has come about so insidiously and cities have grown with such astonishing rapidity that it is only recently that the public has awakened to the importance of this vital problem.

It is not my intention to discuss the question of the comparative merits of raw or pasteurized milk, but to present to you a brief outline of the methods used in New York City by its Board of Health in safeguarding the milk consumed in the city.

The milk used in New York comes from between 30,000 and 40,000 dairies or farms in an area covering some portion of six states—New York, New Jersey, Pennsylvania, Massachusetts, Connecticut and Vermont. The milk is collected at the shipping points or creameries, about 600 in number, and thence transported directly to the city. The longest distance from which it is transported is about 400 miles, while the shortest haul from a creamery is about forty miles. All of the milk

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