

Science Progress

CONTAGION IN MILK.

Something About an Ideal Culture Medium for Bacteria.

There is a strong tendency on the part of humanity to make facts fit a theory. When a theory has been evolved which is ingenious and which exemplifies what may be termed the natural unities, the best trained scientific minds are reluctant to acknowledge its defects. This has gone so far that the highest vantage in scientific training has for its end the inculcation of a willingness to abandon theories and of a readiness to yield up preconceived ideas to facts. The germ theory of disease was accepted as a very beautiful one. Soon after its general acceptance what may be termed a bacteriologist's work was up and the investigator had put within his power the determination of the number of germs in a substance. To analyze a sparkling sample of water or a clear piece of ice, and to determine with accuracy the number of germs per cubic centimetre in the apparently pure material, is certainly one of the triumphs of the laboratory. But when to this is added the microscopic examination of individual organisms and their identification as the causes of specific diseases, the way seems open for the perfect prophylaxis of disease, or for its extermination in the discovery of a substance which is poisonous to the disease organism and harmless to the human system. Many mistakes and wrong assumptions have marked the progress of bacteriological investigations. Attempts have been made to determine germs per cubic centimetre are admissible in drinking water. Investigations on the germs in ice have shown that it often contains large quantities. But the sum of all the work leads to the conclusion that if we are on the threshold of a revolution in sanitary practice we certainly have not crossed it.

One curious fact that has thrown some confusion on the matter. If a large number of bacteria are present in water, a priori considerations would pronounce it unhealthy. But it may happen that these bacteria are of a type that cannot exist in contaminated water, and they may be the best possible pledge for its healthfulness.

The bacteriologist works on the system of cultivating the organisms he works on, and as culture mediums he employs various gelatine substances. These are found favorable for the growth in question. In our articles of every-day consumption we find in milk, to a considerable extent, is an ideal culture medium for bacteria. If organisms dangerous or fatal to the human system get into milk, what in the present aspect of our knowledge, seems a most favorable condition for the propagation of the disease is brought about. In milk the dangerous organisms can live and thrive, and the extended use of milk makes it an effective agent of contagion.

In the town of Montclair, N. J., a number of cases of typhoid fever have occurred recently, which appear to be due to contaminated milk. The milkman who supplied the milk lived in a village about three miles distant, lying on the other side of what is termed the Orange Mountain. This is a hill of trap rock interposing a barrier between the two localities. The drainage of one place is effectively shut off from the other.

A number of weeks before the disease appeared in Montclair there were two cases of typhoid fever in the milkman's family. The milkman while was taken daily to Montclair and sold to the dealer's customers. Recently typhoid fever made its appearance in Montclair, and a number of deaths from this and similar complaints were recorded, most of which were apparently traceable to this milk—at least those affected with typhoid fever were consumers of the milk in question. Besides the deaths, there have been a large number of fever cases, and these very many occurred in families using the milk. One theory holds that the well on the milkman's place had become infected. The bottles in which the milk was delivered were washed with water from this well, and the germs of contagion, it is supposed, were thus introduced.

Nothing is more difficult than to accurately trace the source of such epidemics as this. If no one was affected except those using the suspected article the case would be a conclusive one. But it always, or nearly always, appears that there are cases which cannot be traced to the suspected source, and these occur at least some doubt in the matter. A large and prosperous settlement suffers in reputation from such occurrences, often, perhaps generally, unjustly. If the trouble can be located, as it is in this case, there is service done to the community, and the physician and sanitarian both can feel that their profession has in a sense achieved a triumph. The location of a trouble is more than half the cure.

In the fever cases at Montclair a high measure of certainty is attainable. In brief, the known typhoid cases all occurred in individuals who had partaken of the milk. The origin of the disease is thus fixed about as certainly as is possible in such cases, and the outbreak so definitely limited may be taken as a tribute to the healthfulness of general local conditions.

At the present day, with modern house sanitation and with good water supply, the community seems safe against the dreadful plagues such as described by Boccaccio and Defoe. The fact that an outbreak such as that at Montclair attracts so much attention is really the best proof of the good hygiene of modern conditions. A little care would seem to almost insure humanity from these dangers. Sterilization of milk is now very extensively practiced, and is carried out in many families.—Scientific American.

The Cost of Living.

According to some recent statistics on the cost of living, an Englishman spends, on an average, \$48 a year for food; a Frenchman, \$47; a German, \$42; a Spaniard, \$33; an Italian, \$24; and a Russian, \$23. Of meat the Englishman eats 109 pounds a year; the Frenchman, 87; the German, 64; the Italian, 26; and the Russian, 51. Of bread the Englishman consumes 380 pounds; the Frenchman, 480; the German, 400; and the Russian, 635.—Scientific American.

WING ON WIND.

The Harnessing of this Wonderful Power for the Farmer's Use.

A great number of valuable horses have been running wild on this farm from long ages before it was a farm. They have mostly been doing mischief—sometimes in playfully carrying off a man's hat or hay stack—sometimes gently shaking off the few apples the worms had spared—or with John Frost as a rider coming through the cracks of the old barn and playing round the shivering cows and horses, and departing with considerable of the balance of the farm profits that should have been mine.

To harness up a few of these horses and let them work for me instead of against me has long been my study, says J. E. Wing, in Country Gentleman, but I was never sure I had seen a good, practical harness until I saw the geared aeromotor of Chicago. I put up a twelve foot wheel on the new barn and will tell how we like it. But first a thought as to what enormous power goes to waste over our heads nearly every day. Were I to put a row of windmills across the farm, say half a mile long and with twelve-foot wheels, it would take 220 wheels, and with a fifteen-mile wind they would give over 880 horsepower. That would be using the force of a strip of air twelve feet deep across the farm. Now it would be entirely possible to use most of the force for 100 feet of depth by having wheels at different heights, giving eight times that power, or say 7,000 horsepower, which it is quite possible and practicable to use, if it would pay. And there is further power above that we cannot harness, of the magnitude of which we have no conception. I have stood on mountain tops at about 10,000 feet altitude and felt the impatient, resistless force rushing by, almost strong enough to take me off my feet, and if we calculate a million horsepower going to waste over our farms within two miles of us. When our coal is gone we will take some account of it.

We expected our aeromotor to run all right in a heavy wind—one that would blow your hat off—but had no idea it would do good work in a gentle breeze. We find it gives all the power we can use for a two-hole shelter when there is a very gentle wind—say six miles to the hour. And when it blows harder than that, the grinder keeps it from running too fast, which is somewhat apt to do. In grinding, I find while the rapidity is in direct proportion to the wind—about ten to fifteen bushels of corn to the hour is the maximum—we grind wheat into graham flour, corn for the table and for the cows. Our well is located 220 feet away. We convey the power to the well with a small wire cable and force the water out to the barn. As yet we have no tank, but pump directly into the troughs for 500 sheep, whenever needed—about three times a day, as a rule. Once in a while there is a day when it will not run at all, when we have to resort to the old hand pump again; so a small tank will be added to our outfit next year.

My friend, when it can be economically bought, I mean to add a small dynamo with storage batteries and motor to the plant; then we will not use the power direct from the mill, but set it to storing electricity for us, which we can carry to any part of the farm where power or light is needed. With enough storage batteries and proper size of motor we can make the four-horsepower mill give us ten horsepower for cutting and grinding, sawing wood or threshing grain until the storage batteries are emptied. But by letting the wind work the whole twenty-four hours we ought to get ten horsepower for say eight hours. At present the machine is the most useful thing on the farm, and by its aid I am doing without a hand.

Making Butter in a Small Way.

Now-a-days there is so much said and written about creamery butter that one is apt to forget that in hundreds of homes women are making butter in a small way just as their grandmothers did. Last January I was visiting at a farm home and my hostess churned in a most primitive fashion—stirring the cream in a tin pail with a ladel. As she has Jersey cows it does not take her long to bring the butter, and she thinks it much easier to stir the cream than to bother with a churn. This churning produced ten pounds.

My friend has two fresh cows and one that had been milked for some time. From these she made from fifteen to twenty pounds of butter per week after using what milk and cream a family of four or five grown people need. The method of making this butter is as follows: The milk is strained into four or six quart pans, the latter filled quite as full as will be convenient for carrying. It is set on the stove and heated quite hot, but not scalding. To insure this heating without scorching the milk, the grate from the oven is first placed on the stove. The milk is then set away in a pantry that is heated with the sitting-room stove. During cold weather there would be about five milkings a day, and at the time the summer weather the milk is skinned much closer. The churning is done twice a week. The butter is worked but twice, the salt—about a teaspoonful to eight pounds—being put in at the first working.—Housewife, in Ohio Farmer.

A Pasture Pointer.

It is not uncommon for inexperienced stockmen to think they have secured excellent pasture because they can turn into a field where grass is a foot or more high. Except with clover, and not at all ways with that, a large growth is not the sweetest and most nutritious. Very often indeed the untouched grass in the pasture field is left uneaten because it lacks the sweetness which cattle found in shorter and more nutritious. We have often seen the grasspated down almost to the soil over an underdrain, while the grass grew green and, apparently, just as good, but uneaten, a few feet away. Then, too, a dressing of mineral fertilizer, either potash or phosphate, will do much to sweeten this too large growth. Probably on most soils the potash adds phosphate also by making what the soil contains more soluble.

Summer and Eggs.

Do not be discouraged because eggs are low in price. The summer season is most favorable for poultry, and if eggs are cheap you will get more of them, and the cost of the food will be less. If farmers will keep an account of receipts and expenses they will find that the summer is the season when the most profit is made from poultry. Less labor, less feed and less liability to roup and other diseases may be credited to the summer, compared with winter.

NATURE'S TURKISH BATH.

The Hot Springs in the Central Part of Japan.

In the central part of Japan is a country known among the natives as Kiensha or "Seven Hells." On account of its remoteness and this uncomfortable traveling of the country the place is rarely visited by travelers. At the Seven Hells there is a veritable Turkish bath establishment which has been set up by nature, and the natives flock here to be cured of various ailments. There is an underground steam room and pools of various degrees of heat and cold. The following is a traveler's story related in the Scientific American.

"Once over the mountains I was almost in sight of the 'Seven Hells.' An arm of another sea lashed up in a narrow neck. On every side stood gigantic mountains capped with snow, while below lay the beautiful valley. It seemed as if I might be entering Paradise. I walked a little further, and in a moment the earth resounded beneath me. I had reached the 'Seven Hells,' and all that had been told me of the place was fully demonstrated.

"Just a few yards from where I stood was the 'Boiling Sea.' A great smoke and steam arose like a cloud from the water, and upon examination I found that the sea of water was boiling, and the bubbling like a pot over a stove. The water was scalding hot, and would cook an egg in two minutes. This boiling sea is considered sacred by the natives, and the government had at one time to erect a fence around it to keep the people from plunging in.

"From the Boiling Sea a continual stream of hot water runs down through a village of about 300 people, who are the most peculiar human beings outside of China. In the centre of the village is a big round bath of hot water from the sea. In this bath from ten to twenty-five are constantly to be seen bathing. There are no screens or coverings, but men, women and children all bathe together in Adam's simplicity. I saw at one time nine women and ten men in the bath.

"About fifty steps away from this place is a 'sweat bath,' dedicated to one of their gods. An open shelter is built in the streets over a cavern in the earth which they say Buddha built for them. The excavation has a door to it similar to an old-fashioned sweet potato house that Southerners build to keep their potatoes from freezing in winter. The door is about three feet square, and there is no way for either a person or the steam to escape by the door. In the steam front were priests selling tickets for half a cent each, and six persons were admitted to the sweat bath at once. Just over the entrance stands an image of Buddha, with rice cakes, flowers, and incense offerings. The people worshiped as they went in, while an old priest stood by telling the people that whose ever bathed in faith should be cured of all maladies. The priest listened with eagerness. The priest said that Buddha sent down his angel, who met an ancient priest and told him that he would write the name of Buddha on a stone and cover it with the earth and cause the mountains to gush out with hot water and flow over the name of Buddha for the healing of all diseases believers. 'This,' said the priest, 'is the place prepared by the great gods, and if you would be healed enter in and bathe.'

"It was amusing to notice the deluded men and women, in companies of six, go into the bath and stay until almost dead from suffocation, and come out dripping with perspiration and covered with straw. It seems that a stream from the Boiling Sea runs under the excavation, and inside is thrown a lot of straw on which these men and women spread themselves and stay until they fairly roast themselves alive. From this place they go to a hot shower bath, which consists of several large bamboo poles placed in a waterfall from the hot sea, which fell about ten feet upon the bodies of the saints just from the sweat bath. From the shower bath they go to the fountain. The entire process often takes several hours and is gone through without clothing or towels of any kind. This keeps the streets alive with men and women walking here and there as naked as they were born into the world.

"Another peculiarity of this strange people is the way they have some religious superstition connected with it, and their cooking and eating are not an exception. I am safe in saying that no people on earth cook like the people who live at 'Seven Hells' on the island of Kiensha, in the marvelous little nation of Japan. They have arranged to run the water from the Boiling Sea in small streams, about a foot under the surface of the earth, right in front of every man's built like a pot, with a lid over some of them. In their ovens the people place whatever they want to cook, and the steam from the hot water does the work. This is certainly better than natural gas. Many of the people, and in fact most of them, merely dig a hole down to the hot steam, place some straw over the water, cover them up for a while until they are ready to eat. I saw many people cooking in this way.

A Memorable Year.

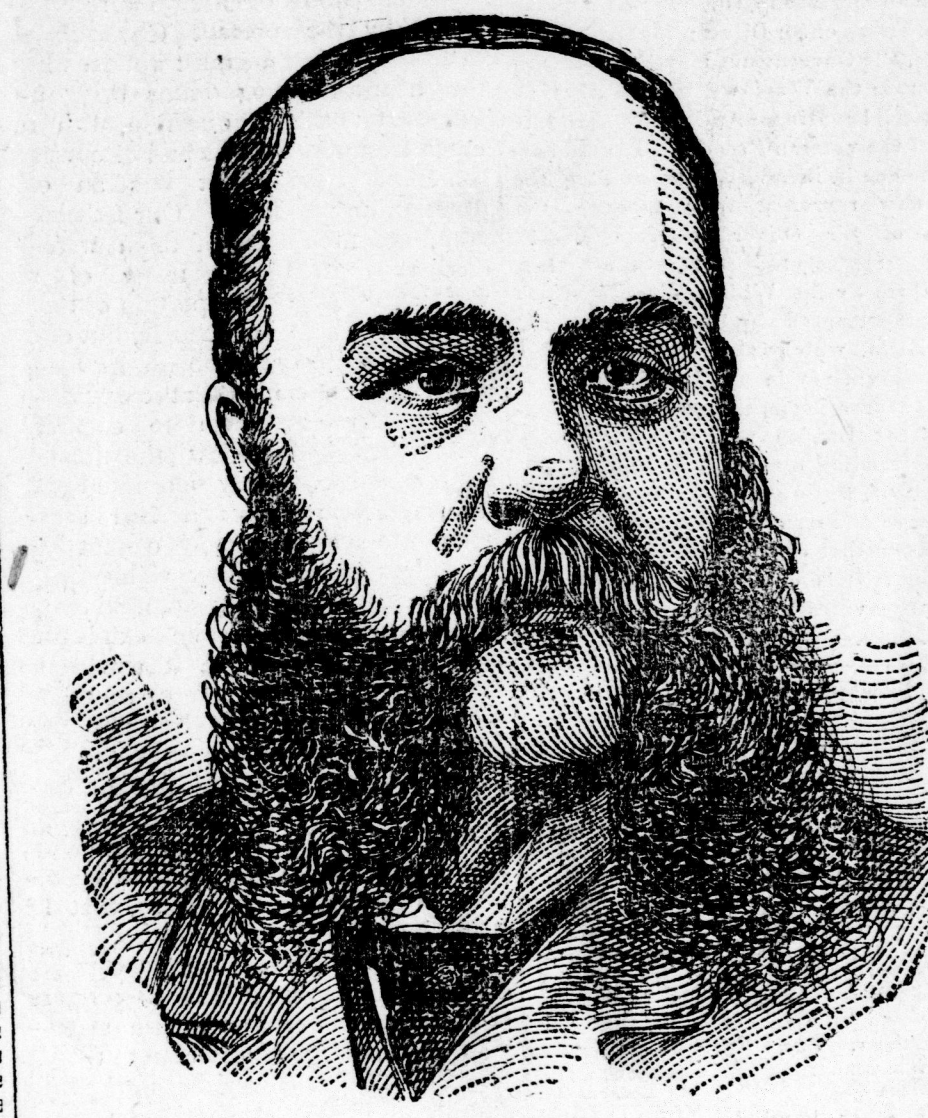
The year 1894 will be signalized by a remarkable series of international exhibitions. On May 5 the Antwerp Exposition was opened by the King of the Belgians, and will probably prove to be the largest and most attractive exhibition held in 1894. The World's Exposition at Lyons, held by the authority of the French Government, was opened on April 28. On May 1 a Grand International Exposition was opened at Madrid. The exposition will be held in a stately building, and most of the European nations will participate. There will also be an international exposition at Vienna, the preparations for which are well under way. The San Francisco Midwinter Fair can certainly take rank as an international exhibition on account of the large number of countries represented—thirty-eight in all. It is a curious fact that after each of the great international exhibitions a series of international and semi-international fairs are held within a year or two.

The Longest Bridge Span.

A new steel cantilever bridge is to be built across the gorge at Niagara Falls, just below the cataract. It will be owned by a syndicate of New York capitalists. In form it will be a combination of the arch and cantilever principles, with a span of 1,000 feet, or 200 feet longer than any arch bridge in existence. It will have accommodation for trolley cars, railroad cars and foot passengers.—Electrical Review.

HE WROTE TO HIS BROTHER.
Told Him the Good News, and Advised Him to Use Paine's Celery Compound.

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A. L. WOOD.

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We would now draw the attention of every man and woman to the fact that, if Paine's Celery Compound will give them what they desire—health and strength. As a proof of this statement we direct attention to the testimony of Mr. A. L. Wood, of Great Village, N. S., he says:

"I have much pleasure in adding my letter of testimony to the already large number you have received. 'In 1892 I took a severe pain in my back, to which I gave but little attention. It extended to the back of my neck, and became very bad. It then seemed to settle on a nerve under the shoulder blade. I used many remedies but got worse instead of better. I consulted my doctor; he said I had neuralgia, and treated me for it. The treatment proved useless, and I consulted two other doctors with no better results. 'I could not turn over in bed, wash my face, or dress myself, I was so helpless. After a time, getting a little easier, I went to my father-in-law's to spend Christmas; while there my attention was called to paper on the merits of Paine's Celery Compound, and I read of a party who had been cured, whose case was similar to mine. 'I sent for a bottle of Paine's Celery Compound, and after taking it I found that I could rest easily, and turn in bed without difficulty. The virtues of one bottle of the compound seemed to drive all trouble away. I might also state that I had a brother-in-law, a California, who owing to sickness was unable to work for three months. He had been to mineral springs without receiving any good results. I immediately wrote to him and advised him to give your medicine a trial. After using one bottle he was cured and able to resume work. 'I make these statements voluntarily and for the benefit of those who suffer, and would strongly recommend Paine's Celery Compound to all.'"

A CURIOUS feature of Japanese journalism is that every important paper is said to have a "prison editor." Japanese journalists are constantly being fined and sent to prison that the sole occupation of the individual is to go to jail when called upon.

A FRENCH physician has devised a vibrating helmet for the cure of nervous headache. It is constructed of strips of steel put in vibration by a small electric motor. The sensation produces drowsiness, and the patient falls asleep under its influence and awakes free from pain.

EXPERIMENTS to determine the influence of electricity upon the growth of plants have shown remarkable results. An apparatus consisting of poles connected by wires for condensing atmospheric electricity over an inclosed area was arranged. The ordinary grain crops grown within the inclosure showed an increase of from 25 to 50 per cent. All other crops were increased in proportion. The scientist who conducted the experiments also tried the effect of electrifying seeds before planting and found that when they were subjected to the current for only two minutes the rapidity of their growth was nearly doubled.

"Cold tea" has gradually gone out of fashion as the prevailing senate tippie since Thurman, Edmunds and their contemporaries have retired to private life, and is now little heard of. The order most frequently given now by the senators when they fly for a few moments from the dreary tariff talk to seek the consolation that the restaurant grants is "pepper and milk," and since the warm weather began, this somewhat mystifying order has been whistled down the tube 50 times a day. A senator who does not drink, but who has heard the mysterious name called out frequently, was curious the other day to see what the concoction was, and on investigation he found that it was simply Pepper's whiskey and milk, which has now come to be the popular senate drink.

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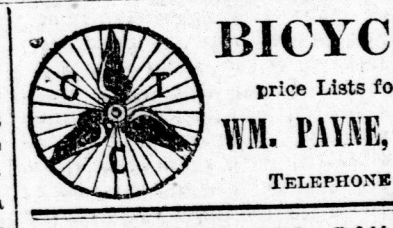
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