

be rejected and the children will be obliged to be vaccinated in compliance with the rule of the board of health, or be excluded from school. It seems to me as homœopathic physicians we ought to take some action on this. We should have a voice in the matter.

Dr. Baylies — They are already rejected in the cities of New York and Brooklyn.

Dr. Allen — And in Chicago.

Dr. Morgan — And in Baltimore.

Dr. Clark — Dr. —, an attending physician at the Willard Parker hospital, says that more complications have arisen, there have been more deaths and much more difficulty than they have experienced without the use of anti-toxine. He takes the statistics of the Boston, Philadelphia and New York hospitals, and conclusively shows that it is a very hurtful substance, and the mortality is very much greater since the use of anti-toxine than before. How under heaven any one professing a knowledge of homœopathy can resort to anything of the sort I cannot tell. The statistics of the old school use of it show a mortality ranging from twenty to forty per cent. This is undoubtedly due to the fact that they have used less drugs than previously, and in some instances the anti-toxine seems to do very much better than the drugs that have been formerly used. So far as my knowledge goes, I think that the homœopathic mortality in diphtheria—which, I presume, includes all sorts of homœopathy—is about ten per cent. (Dr. Fincke, seven per cent.) and how can any one be so foolish as to turn aside from a mortality of seven per cent. and take up something that causes a mortality of from twenty-five to forty? Dr. Gregg says he had not lost one case of diphtheria since he practiced homœopathy.

Dr. Thatcher — The board of health does recognize the results of homœopathy. Just before coming here I had a very dreadful case of diphtheria, all through the head and

throat, and it happened to be in the family of an active politician. Some of the board of health were intimate friends of this man and knew all about the case. Doctor Taylor was one, and he knew all about the case. They were surprised that we had not sent down to the office for tubes and swabs, and so on, and they could not understand how this child should get well in ten days, but in talking it over with this gentleman, he repeated the conversation that occurred. They seemed to think that they ought to investigate me and understand why I did not comply with the regulations of the board of health about the swab. This Doctor Taylor said: "Well, you know these strictly homœopathic measures, and they do have good results". They questioned the father of the child as to why he had not been down to get the swabs to cleanse the throat, or to use injections, and particularly inquired whether there were any injections used in the nostrils. He said no; said that the doctor didn't believe in those measures, he was a strictly homœopathic prescriber. He was very anxious that the card should be taken off the house, which they reluctantly did, but not until they had sent someone there to see the case, and they found the child running around the room perfectly well, and immediately disinfected the room and took off the sign. So it is evident that they do secretly give us credit for results.

Dr. Baylies — That is, when they cannot help it.

Dr. Fincke — In Brooklyn, where two years ago the great vaccination epidemic raged, they are making a little change; they are now satisfied if the children bring a certificate from a physician that they have been vaccinated—so Dr. Close told me—having given several such certificates which were accepted. In a case of diphtheria the board of health sent a young man who looked into the throat of his patient, took a swab from it, went home and put it under the microscope to search for the bacillus, for that is the



kind of a diagnosis they make. He said it was really diphtheria, and Dr. Close gave some remedy, I don't know what; the next afternoon there was nothing to be seen and the diphtheria was all gone. When the man from the health board looked into the throat, he was stupefied and didn't know what to say. Now if they want to get up a scare again, a small pox scare, a few cases are sufficient, but it seems they will be careful in exercising their authority again to the former extent, for the reason that physicians will go against it. Shall the microscope govern our actions? These health people take the business out of the physician's hands; they make experiments in chemical laboratories and then have us apply their foolish remedies. I want you all to go against it with all your might and main: tell the people the truth of the matter to bring them to their senses.

Dr. Hastings — We succeeded two years ago in Massachusetts in modifying the law that governs certificates, to the extent that a certificate from a physician to the effect that in his opinion the child would be injured by vaccination, is sufficient to admit without vaccination.

Dr. Fincke — In Newburgh, the board of health has made a law that they will accept a certificate that the child's blood is vitiated in some way, that it won't bear vaccination, so the parents would be obliged to go before the people and say that their child's blood is vitiated.

Dr. Custis — There is nothing like having a little fun. I don't think as homœopathic physicians we need much more than to watch the evidence of truth we get through the allopathic ranks. This anti-toxine craze is doing them good. Since they have had that their attention has been called to the fact that local treatment is not necessary in diphtheria. We find many of their strong men advocating letting the throat alone. So they are receiving some benefit to themselves from this anti-toxine, and they will come out

all right after a while, I hope. The statistics of Dr. Winter certainly are unanswerable. He was the first one, I believe, that fought the matter in the allopathic ranks; I think he is the man who admitted that he killed seven out of twenty last year. We cannot find much fault with the work of anti-toxine so long as we are not personally responsible. I do object to classing anti-toxine and vaccination together. While we cannot find any homœopathy in anti-toxine, except possibly in the fact that they do potentize by culture, I do not believe they do really potentize; I don't believe there is much of anything in it except a deposit and carbolic acid, but there is something in vaccination.

Dr. Hastings — I would like to make this suggestion in addition to the printing of this paper, that the reference which has been made to the child, who died in two minutes, might be amplified in a foot note in which the particulars of the case might be given. I think it would carry more weight if the actual statement of a case were made rather than a reference to it.

Dr. Fincke — That can be done; will the secretary please note it.

Dr. Baylies — In reply to Dr. Custis, I will say that they introduce septic matter, pus, and the virus of various forms of disease with vaccine. They produce malignant forms of disease, and kill with vaccination.

Dr. Custis — I do not deny that, it is the fault of the method.

Dr. Baylies — It is undoubtedly the fault of the method, and it is the method which has been in practice for the last hundred years or so, ever since the time of its originator. It is a traditional barbarism that ought to be stopped.

Dr. W. M. James — Mr. President:—I think that for the future, instead of a decline in the allopathic ranks of this principle of vaccination or inoculation, there is going to be a great increase of it. They have gone from the vaccination



for smallpox to inoculation for diphtheria, and now they propose vaccines for everything. That comes from Pasteur, and the whole story of the origin of this thing is certainly a very remarkable one, and I may say that I have grown up witnessing it. In my boyhood I remember reading of the beginning of Pasteur's work and its development on and on up to the present time. When Pasteur began his work—and it all originates from Pasteur—there was devastating the kingdom of France, or rather the empire of France as it was at that time, a disease among silk worms which had baffled every means taken to stop it. This disease had begun along about 1848, and it reached its acme about 1863. It had reduced the silk culture of France from a value of over one hundred millions of francs a year, to something over ten millions of francs a year, and, of course, it had created a great panic in France, and a great anxiety in every way. The result was that herculean efforts were made to stamp the disease out, and finally the French government offered a prize of five hundred thousand francs for the discovery of some means of arresting it. All sorts of experiments were tried. Silk worms were introduced from Japan, and these creatures, brought from a climate where they had thrived perfectly well and produced a fine grade of silk, immediately sickened and died in the atmosphere of France. What was the matter? It was then that the secretary of the celebrated French Academy, Professor Dumas, wrote a letter to Pasteur. I should say that Pasteur had previously been known as an analytical chemist. He was also an investigator of the subject of fermentation. Before his time, and up to the time that I speak of, the theory of fermentation had been what they called a catalytic action, which was simply a word used to obscure the fact that they did not know what was really the cause of it, but it was supposed that it could not go on unless a temperature of at least ninety degrees was secured and an abundance of atmos-

pheric oxygen. Pasteur was devoting himself to the investigation of the phenomena of fermentation. Dumas wrote to him and asked him to investigate this silk worm disease, and Pasteur wrote back that the thing was perfectly absurd; that he knew nothing about silk worms, had never seen one in his life, and had no idea how they developed themselves. But Dumas wrote again, for the two men were intimate friends, and finally Pasteur was induced under the influence of Dumas to undertake the problem. He located himself in a cocoonery in the south of France, overlooking the Mediterranean sea, and began his investigations.

It is too long a story for me now to tell you all the steps by which he came to a conclusion on the subject and its bearing upon the present question of anti-toxine. I will simply pass over that and summarize it by saying that he discovered that the silk worm, in the course of feeding, absorbed into its system a fine dust which lay upon the surfaces of the leaves of the mulberry tree; that this dust, instead of being what we ordinarily understand by the name dust, was really a vegetable ferment, a vegetable cell; that this cell located itself in the spinning system of the silk worm. The silk worm's method of making silk is to eat the leaf, and through the complex operations of digestion a fluid is prepared, which is somewhat suggestive of the lymphatic fluid which circulates through our skins; similarly, this fluid circulates in long tubes along the whole length of the worm on all sides of it, which are the glands that manufacture it. There are two apertures at the end of the worm, through which this fluid comes into the external air. It comes in a minute drop which immediately hardens as soon as it comes in contact with the atmosphere; it is followed by another drop which similarly hardens, and so on, until a filament is formed. Thus a fiber of silk is a series of these little drops welded together. This germ, this fine dust, this microscopic plant, this unicell plant, located itself in these tubes, and there fed



and propagated itself. The result was the worm became exceedingly sick, refused to feed, lay about in a stupid state, its surface naturally almost white, or faintly flesh color, becoming mottled all over, so that it looked as though black pepper had been shaken upon it, whereupon Pasteur named the disease *Pébrine*. He then found that the mulberry leaves from a certain district in the southeast of France, where the principal occupation of the people is raising mulberry leaves, contained more of this dust than any other, and he interdicted their use provisionally. That caused Pasteur to be persecuted, and it is said that when he made his appearance in that district, stones were thrown at him by the populace. He afterwards modified the prohibition and directed that the leaves should be washed, which got rid of a great deal of the difficulty. He then from one point to another, came to the idea of extreme cleanliness with regard to the worms. They had to be put in glass cases, carefully washed out and guarded from the external atmosphere by a filtering arrangement, so that all the air that came to them passed through cotton wool. Then he caused the whole cocoonery to be thoroughly washed and scrubbed, and then every leaf that was fed to these worms had to be similarly washed, and in that way he avoided the whole cause of the trouble. Having gone so far he presented a memorial to the French Academy, but there was in that academy a potentate or local 'boss', who had written a great deal on the subject and had built up a very large book about it, but had given no solution of the problem at all. The consequence was that this man, afraid of his supremacy, caused Pasteur's paper on the subject to be laid on the table without reading. Afterwards, Pasteur proved his point with regard to it by taking eggs and saying "now, you raise them and you will find that when they are so many days old, they will hatch, they will moult so many times and then sicken and die. Here are some other eggs that will

hatch and when they have passed the second molt, they will die. Here are some other eggs that as soon as hatched will die,"—and it came out exactly as he had said; for he had followed out these different sequences so exactly, that he was enabled to separate the worms into colonies and was able to judge in that way. Thus his statements were proved, Pasteur's enemies were silenced and deferential attention was paid to his assertions. Finally his directions were followed with regard to cleanliness, and the silk worm disease gradually disappeared. Then it was that they were glad in the Academy to open this paper and read it, and he was afterward made one of the immortals.

The revelations made by Pasteur in the investigations of the silk worm disease were so novel, so astonishing, so consistent and rational; the means taken to destroy the disease, as suggested by the discoveries, were so successful that the attention of the whole scientific world was arrested, and much thought was excited. The principles established were applied to the diseases that afflict the human body, and thus the germ theory of disease was founded. Prominent among these men who became interested, was Professor Lister of England, who was a surgeon. He had been much perplexed by the enormous suppurations that followed when, in amputations and other operations, large surfaces of the deeper tissues were exposed to the atmosphere. Pasteur's discoveries opened his eyes to the causes of these heavy drains on the system and he set about applying Pasteur's principle to the treatment of the wound. He therefore hunted around for some means of destroying these germs. I want to stop right here and tell about Professor Tyndall in Switzerland. Professor Tyndall went to Switzerland for the purpose of investigating the glaciers, the cause of their motion, and why they were able to turn corners, and what not. He was deeply struck with the color of the lakes of Switzerland, which is an intense blue. After much



investigation he discovered that the forward motion of these glaciers ground the rock to an impalpable powder, which was of such minuteness that when the streams of water flowing from the melting glacier washed it into the lakes, instead of settling to the bottom much of it was held in suspension in the water. These particles were sensitive to the blue color in white light and reflected that color to the eye, selecting it out so to speak from the other colors. He finally was able to reproduce that color in a small way in a tank and exhibit it to a large audience. He took a solution of gamboge in alcohol and dropping it into water, the water diluted the alcohol so that it could no longer hold the gamboge in solution, the latter not being soluble itself in water. The gamboge settled in fine particles, so exquisitely fine that they were incapable of reflecting *all* the colors of white light. They sifted the vibrations so to speak, and passed only those having seventy-eight millions of millions of vibrations in a second, in other words, blue light to which alone they were sensitive. Later he investigated the question as to whether any of the sun's heat coming down, to our earth, was intercepted or not by the air. In order to determine this question, he constructed a long tube, some sixteen feet long and four inches in diameter, and supported on uprights, horizontally. This tube was first made of brass. He put a hot water vessel at one end, the heat from which he sent through it, its ends being stopped with plates made of rock salt. At the other end was a galvanometer, and a thermo-electric pile, these two combined forming a kind of thermometer, registering one ten-thousandth of a degree. While studying the question as to whether any of the heat was lost in going through the tube, it occurred to him to change the brass to glass, and then he found more phenomena. He found that when he pumped out all the air from this tube, and allowed the light from an electric lamp to come through that, there being no atmosphere in there,

therefore no dust floating in the atmosphere, the tube appeared perfectly black toward the side, whereas at the end a tremendous flow of light met the eye. The lamp was of course enclosed in a case, and had a reflector and condensing lenses. He then admitted into this tube small quantities of air, which were loaded with cologne water, alcohol, chloroform, and with different kinds of essential oils for different experiments, and small quantities of ordinary water. The small amount of air he admitted would diffuse itself so suddenly, that the minute quantity of vapor, or alcohol, or whatever it was that went in with it, was torn to pieces, so to speak, reduced to very small particles which were sensitive to seventy-eight million millions vibrations in a second, the wave length of blue light. Therefore the result was the whole tube became full of blue light. That fact has this bearing: that the blue color of the atmosphere is due to dust in the atmosphere, just as the blue color of the lake water was due to infinitely fine particles diffused through it, that this dust is of every variety, that it is ground up earth, that it is water vapor, that it is the pollen of plants, that above all things it is the germs that are in the atmosphere in every direction. The germs are ferments. To define a ferment we may say that it is a vegetable cell, which, falling into an organic fluid, immediately by reason of the hydrocarbons and nitrogenous substances which are contained in the fluid begins to propagate itself. It takes from those substances, whether it be the juice of a grape, or the extract from grain or what not,—it takes from those substances whatever of hydrogen, carbon, or nitrogen may be necessary for its own organization, and leaves the rest a confused heap, we will say. It is as if the keystone of an arch were taken out and the arch fell into a fantastic ruin. If the ferment that falls into grape juice, for example, be the ordinary yeast plant, the same that is used for raising bread, it extracts from that grape juice whatever is necessary



for its own sustenance, and the rest falls into a fantastic ruin. That fantastic ruin is alcohol, water and carbonic acid gas, (which makes the froth) and the particular essential essences that give the flavor to what is now wine, or if it be the juice from barley, malted barley, that gives it the flavor of beer.

Now, the better to get that idea of the ferment—I will repeat the definition. It is a vegetable cell, which, falling into an organic fluid, takes from it what is necessary for its own sustenance, and leaves the rest a ruin, which re-forms itself into new shapes; therefore we have the yeast ferment or the vinous ferment, which produces alcohol, carbonic acid, and these wine flavors; we have the butyric ferment, which, falling into substances that are suitable, like milk and such things, will produce butyric acid, which is the acid of rancid butter, and other things which go to make up the offensiveness of cheese. We have the lactic ferment, which falling into milk takes from the milk-sugar what is suitable for its own sustenance, and the remainder is a ruin, which we know as lactic acid. There is the acetic ferment, which is a plant falling into a substance like the juice of grapes or apples or pears, takes from these substances what is necessary for its own sustenance, leaving the rest decomposed. The remnants re-form themselves, and we have acetic acid, or vinegar.

Finally we have the putrefactive ferment; a plant which falling into organic fluids or upon moistened animal tissue, breaks it down in procuring its own sustenance, and these broken down products consist of a number of offensive gases and a variety of poisons called ptomaines of the most virulent character, and then we say that the substance has putrefied.

So, by the extension of the analogy, scarlet fever is a plant, which being absorbed into the human system, lives upon the organism and absorbs what is necessary of the

fluids of the body for its own sustenance, and leaving the rest decomposed. These remnants re-form themselves into substances which affect the blood and cause the eruption of the skin; in other words leucomaines.

We come to another point. Bastian, of London, declared that cells could be produced spontaneously. His principal competitor and opponent was Professor Virchow, the celebrated cellular pathologist, who declared that every cell lived by descent from an ancestor, and so on infinitely back to creation. Bastian had produced experiments in the laboratory that to his mind, and to the judgment of the scientific world, conclusively proved that cells could be formed spontaneously by the presence of moisture and sunshine and heat. Pasteur reproduced his experiments with more care and, with the instruction that he had received from his investigation of the silk worm disease, he realized that every time that Bastian had produced his experiment, he had unwittingly introduced a living cell into his fluids, and so really inoculated them. Bastian's fluids were mutton broth, chicken broth, and what not, that had been filtered so that it was perfectly clear, and yet was full of the juices of the meat. He placed it in vials that were peculiarly made, with a tubular opening drawn to a fine point so that they could be instantly sealed by the slightest application of flame. He had set these in sunshine and they had promptly developed cell formations. Pasteur reproduced his experiments with more care. He found that when he took sufficient care to avoid the introduction of these cell-ferments the fluids did not change in any respect; it was only after live cells were introduced that the fluids changed their character. He would take mutton broth that was absolutely crystal clear; he would introduce a few cells, that he could count under the microscope, on a little loop of platinum wire, and then he would set the flask in the sunshine. It would immediately