been thought to be unfavorable for operation, because of their tendency to recur.

Two years ago Bergmann held the solitary tubercles are ordinarily not suited for operation. In a very interesting paper published by A. Preyer,⁹ from the clinic of Roux of Lausanne, are collected all the cases of brain tubercle operated on up to that time. There were 16. One case has since been reported by Heidenhain.⁷ The case above presented makes the eighteenth. Three patients died as a result of the operation. Six patients survived a number of months. Two patients died a number of years after the operation. A case of Czerny's lived four years and two months. A case of Horsley's died seven years and eight months after the operation of tuberculosis of the spine. So far as can be learned there are now living four of the cases operated on for solitary tubercle of the brain. Two cases of Roux, the one above reported and one of Kroenlein's, the latter living six years after the operation. Although these data are far from brilliant, they militate against the dictum of Bergmann above alluded to. When it seems certain that the tubercle is solitary and unaccompanied by changes in the meninges as made manifest by lumbar puncture, an operation is followed by the three-year limit of recovery in over 25 per cent. of cases, the justification of operation for brain tubercle seems thoroughly established.

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SOME FACTS ABOUT VACCINATION.*

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Owing to a lack of exact knowledge from absolutely reliable sources on the subject of vaccination, there is a good deal of misapprehension in the public mind as to the efficacy of vaccination as a protection against smallpox, and the constant inquiry is made: "When shall we vaccinate?" "How long does it protect?" and "How often should we be vaccinated?" Many members of the medical profession, busy with other things to do and not compelled to face the epidemic horrors of a hundred years ago and not exact in their knowledge on the subject of vaccination, have a halting, uncertain, confused state of mind on the subject, which goes far to create doubt in the public. There are doctors, and good ones, too, who have had so little experience with vaccination that they do not know what constitutes a successful vaccination. I visited a neighboring town where a reputable physician of unquestioned ability told me he had a case of what he believed to be smallpox in a child he had vaccinated six weeks previous with a typical result. With the doctor I visited the child, found smallpox present, but absolutely no evidence of vaccination. There had been a scarification—too deep and too large—a black scab and a sore, but no vesicle, no febrile reaction and no scar. Had not some one who knows a vaccination seen this child the story would have been published to the world that a child had small-

pox who had been vaccinated six weeks before the attack—a circumstance that never occurred and never will occur. Within a year there have been cases of smallpox reported by doctors as having occurred in persons after a recent vaccination. I am perfectly satisfied in my own mind that such cases are either chicken-pox, mistaken for smallpox, or more frequently the supposed post-vaccinal victims are not vaccinated at all, but have sore scarifications which are mistaken for and put down as vaccinations.

Many physicians not familiar with the glycerinated lymph had read that the new lymph produced results less severe than that produced by the "points" they had formerly used; secured spurious lymph from an active, enterprising firm and mistook the mild or severe sore, as the case might be, caused by the scarification and sometimes extraneous infection, for a true vaccination. This inert lymph even in the hands of competent doctors has caused doubt and confusion in the minds of many as to the efficacy of glycerin lymph, and has also caused to go on record cases of smallpox in persons supposed to have been recently vaccinated. Thousands are now relying on a false security produced by the use of this inert lymph. Dr. F. J. Runyon of Clarksville, Tenn., based his paper condemning glycerin lymph almost wholly on this firm's inert product. Dr. Runyon says: "Ninety to 95 per cent. of those vaccinated in 1900 with this lymph are still liable to smallpox." This is a fruitful source of error in the records against vaccination which should be eliminated. Inasmuch as I have evidence that this firm is producing potent lymph now, I need not mention names.

Another source of error is that it has been customary to record as vaccinated persons vaccinated after exposure to smallpox. This is now done in London, England, and the blunder has been pointed out by the British medical journals.

The report comes from London, England, that half the persons dying from smallpox had been vaccinated. I care not where such statements come from, they are not true. Such a statement means that the records are not made from facts; that they are perpetuating the old errors, taking the patient's word for fact and recording cases as vaccinated who were never vaccinated until after exposure. I have had reputable physicians tell me that they have had typical vaccinations with no resulting scar. Such a result is not to be relied on as protective. Re-vaccinate all such and another source of error will be eliminated. A successful vaccination may be known by the presence of vesiculation, umbilication, pustulation, mild and limited inflammatory area with febrile reaction. In about twenty days from the beginning of the vesicle the resulting scab comes off. This leaves a characteristic scar unlike that produced by any other agency. This refers to a typical result only. We must look with suspicion on any vaccination lacking these characteristics.

No person is insusceptible to vaccination. That is, vaccinia can be induced at least once in every person. I have known eight, ten, and in one instance—in the practice of the late Dr. Garrott of the Chicago Health Department—thirteen attempts to be made before a successful result was attained. Had Dr. Garrott stopped at the twelfth attempt the child would have been considered insusceptible. It is mischievous and untrue to teach that there is such a thing as insusceptibility to vaccinia.

In some persons one vaccination will protect for a lifetime, but in many cases the protective influence will be

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partly lost in from five to thirty years. It will protect against death from smallpox long after it has ceased to protect from smallpox. It is not claimed now that one vaccination gives immunity from smallpox for life, though it often does. In most persons two vaccinations are all that will take, once in childhood and once in later life. By experience it has been found that there are comparatively few people in whom vaccination will take more than twice in the course of a lifetime.

One scar, I believe, is as good as several, unless the scars are made with an intervening period of time. When a vaccination is made the resulting reaction in the human economy is systemic, and one point of inoculation is as efficient as several. This was the belief and teaching of Jenner himself. When smallpox has been inoculated at one point the resulting disease gives the same immunity as does a multiple inoculation, and the same is true of other epidemic diseases. The figures produced to show that persons with multiple vaccination scars are better protected from smallpox than those with but one scar do not take into account that some of these scars, where more than one exists, were not made at the same time, but were from revaccinations at a later period.*

My own observation on vaccination in relation to smallpox, begun in 1893 and continued to the present time, leads me to believe that vaccination is more certainly protective against smallpox than the figures of most of the records we get will warrant. The fault of most of these records is that they are based on the statement of the patient that he has been vaccinated. An examination of the arm will disprove this statement in a majority of instances. The records are often made by the nurse who accepts the patient's word as fact. Anyone who has had experience with smallpox knows how unreliable the patient's statements are. Ask a hundred patients if they are vaccinated and nearly every one will say yes. Examine their arms and tell them you see no mark, and they will reply that they were vaccinated but that it did not take. Of course, this is no vaccination at all. To most persons a vaccination and an attempt at vaccination is the same thing. People say they have been vaccinated whether the operation is successful or not. Had we not examined the arms of the 591 cases of smallpox in the Chicago Isolation Hospital, but taken the word of the patient for the vaccinal status, more than half of them would have been recorded as vaccinated. And again, any scar at the site of an attempt at vaccination has been recorded as a vaccination. We have done this at the Chicago Isolation Hospital so as to be fair and avoid

the charge that we were manufacturing statistics, though we feel sure some of these are scars from infection and not from vaccine. Again, recording, as before mentioned, cases as vaccinated who were vaccinated after exposure, but too late to prevent the disease, have worked injury to the truth about vaccination. A close examination of all arms by experienced physicians will eliminate these sources of error which, in the past, have been recorded as truth, to the great detriment of accurate information on the subject of vaccination.

I do not hesitate to say that vaccination repeated till the susceptibility to vaccine is exhausted is an absolute protection against smallpox. This is the protection given the employes in the Chicago Health Department while they are handling and nursing the sick and burying the dead from smallpox, and in no instance has any of these thus employed contracted smallpox. This is the protection given the 3,200 policemen of Chicago, who, next to the employes in the health department, are the most exposed to smallpox of any class in the city. No case of smallpox has occurred among the policemen of Chicago in the ten years I have been in the health department. Vaccination on entering the school, and again seven years later, is the protection from smallpox given the 265,000 school children of Chicago, and in ten years but 7 cases of smallpox have occurred among the school children, and all of these children were in school with a false certificate of vaccination. In one instance last year a child in school with a false certificate attended school two weeks while he had a mild form of smallpox and but one child in the school took the disease, and this child also was in school with a false certificate. No vaccinated school child in the Chicago schools has had smallpox during the last ten years, though Chicago suffered a severe epidemic of smallpox in 1894 and 1895, and has had a mild, almost continuous epidemic of the disease for the past three years. During the last two years more than 600 medical students have been permitted to enter the Chicago Isolation Hospital for the purpose of studying smallpox at the bedside, where they were thoroughly exposed to the disease in all forms and stages. Not one of these students contracted the disease. Before permitted to enter the hospital each student was required to have a vaccination, and if the vaccination was more than a few months old, three revaccinations. I offer the experience of these students as proof that vaccination with revaccination gives absolute protection from smallpox. I never saw nor heard of the vaccinated members of a family having smallpox while the unvaccinated members of a family escaped the disease. Scores of times I have sent all the

* Since presenting this paper at the recent meeting of the American Medical Association, my attention has been called to the following passages in a "Report on the Smallpox Epidemic in Illinois, 1881-1883, and the Relations of Smallpox and Vaccination," by Drs. John H. Rauch and F. W. Reilly, and published in the Fifth Annual Report of the Illinois State Board of Health, pp. 211-520. The writers say (page 495): "As to the number of insertions which should be made there is some diversity of opinion. The English and continental practice, or wherever arm-to-arm vaccination is the rule, is to vaccinate in several places—four or five, or even more—and often on each arm. It is probable that the custom arose out of the desirability of securing as many vesicles, which could be tapped, as possible, and that the question, originally, had an economic rather than a protective importance. Jenner's early rule was to make only one insertion; but as he laid much stress on the necessity of preserving the vesicle intact throughout all its stages, it became necessary to multiply the number of vesicles in order to procure a supply for the arm-to-arm process. Subsequently, the oft-quoted table of Marson, supplemented by that of the London smallpox hospitals and one by John Simon, seemed to establish a connection between the number of vesicles and the protection conferred. On the whole, however, there is reason for believing that the quality of the vaccination is of much more importance than its quantity, as measured by the number of vaccinal scars. It is at least certain that the first vaccinations performed by Jenner and

his immediate disciples, proved amply protective, although they consisted of single insertions 'by means of a very slight scratch, not exceeding the eighth part of an inch, or a very small oblique puncture.' Jenner, indeed, distinctly says that 'a single pustule is sufficient to secure the constitution from the smallpox; but as we are not always certain the puncture may take effect, it will be prudent to inoculate in both arms, or to make two punctures in the same arm about an inch and a half asunder, except in very early infancy, when there is a great susceptibility of local irritation.'" The writers continue: "There is no obvious physiological or pathological reason for the claimed increase of protective power through an increase in the number of vesicles. The figures compiled by Marson, MacCombie and Simon, which are relied on to prove such relation, are more philosophically explained by assuming, as is self-evident, that the chance of obtaining at least one perfect—and, therefore, fully protective—vesicle is increased by the multiplication of the number of vesicles. But this is to confess to carelessness or imperfection on the part of the vaccinator which needs to be corrected by using a blunderbuss instead of a rifle. In the thirty-odd years' experience of the writers, with exceptional facilities for observation, it has been found that post-vaccinal smallpox is fully as frequent, in proportion, among those vaccinated in countries where the rule of multiple insertions obtains, as among those presenting single well-marked cicatrices; and that neither the one nor the other is to be relied on to the neglect of revaccination."

unvaccinated members of a family to the hospital sick with smallpox while all other members of the same family who were vaccinated escaped the disease. This is not an uncommon occurrence. I never have seen a case of smallpox in a person who has had a typical vaccination within nine years, though I am aware that it sometimes occurs.

From March 9, 1899, to June 5, 1902, there were 591 cases of smallpox in the Chicago Isolation Hospital. Of these 535 never had been vaccinated; 8 had typical old marks made in childhood from 16 to 50 years previous to the attack; 48 had some kind of an old, doubtful or imperfect mark, said to have been the result of a vaccination performed many years before. Not one of the 591 persons had been vaccinated in accordance with the requirements now known to be necessary for protection against smallpox. All patients were carefully examined by three experienced physicians for evidence of vaccination, and the record here given can be relied on as correct. These figures show that over 90 per cent. of the cases came from the few unvaccinated who are either too ignorant, too careless, or too stubborn to avail themselves of the positive protection to be had by vaccination.

I wish to make a plea for a restudy, from original observation by medical men who meet smallpox, of the subject of vaccination in relation to its protective influence. Throw aside the doubtful records. Take the word of no one as to whether he was vaccinated or not. Examine the person for a scar and record the finding. Eliminate all sources of error. A restudy for the accumulation of new and more accurate knowledge will remove the last objection to vaccination. Vaccination is now more broadly accepted than any other one great idea that has obtained hold in the minds of men, not excepting the Christian religion. There are dissenters in religion; there are those who dissent to every proposition under the sun. There will, however, be left no cause of dissention to the virtue of vaccination when the existing evidence is examined and properly recorded.

At the close of last year Chicago was found to be menaced by smallpox which was prevalent in a vast territory surrounding the lower and upper lake regions. To vaccinate and keep vaccinated the large, floating, lodging-house population was one of the many problems before the health department. Following the policy of the department of educating the people in matters of sanitary importance, "A Vaccination Creed" and a supplement to this creed were prepared, giving correct information on the subject of vaccination for the education and benefit of the lodging-house patrons.

The creed, the outgrowth of experience, was formulated and printed on a card 10x14 inches, and reads as follows:

A VACCINATION CREED.

We, the Undersigned, hereby publicly Profess our firm Belief—based on positive Knowledge, gained through Years of personal Experience and Study of Smallpox and Vaccination—

FIRST. That true Vaccination—repeated until it no longer "takes"—ALWAYS prevents smallpox. NOTHING ELSE DOES.

SECOND. That true vaccination—that is, vaccination properly done on a CLEAN arm with PURE lymph and kept perfectly CLEAN and UNBROKEN afterwards—never did and NEVER WILL make a serious sore.

THIRD. That such a Vaccination leaves a characteristic scar, unlike that from any other cause, which is recognizable during life and is the ONLY conclusive evidence of a Successful Vaccination.

FOURTH. That no untoward results ever follow such Vaccination; on the other hand, thousands of lives are annually sacrificed through its neglect—a neglect begotten of LACK OF KNOWLEDGE.

ARTHUR R. REYNOLDS, M.D.,
Commissioner of Health,
CITY OF CHICAGO.

HEMAN SPALDING, M.D.,
Chief Medical Inspector,
DEPARTMENT OF HEALTH.
December, 1901.

This creed placard was posted up in all the lodging houses in Chicago. A note at the bottom of the poster informed the reader that further information as to vaccination and smallpox is contained in a supplement to the creed—copies obtainable on the premises. The clerk of the lodging house was well supplied with the supplement circular.

The supplement circular in the form of a four-page folder, 4x7 inches, giving facts and figures about vaccination and the reasons for the existence of the creed, was printed, including on one page the vaccination creed, and distributed by the thousands.

The creed poster and supplement were prepared for a specific purpose in Chicago, but they soon found a wider field of usefulness. Other cities and towns made use of them combating smallpox. Railroads applied for and received for their use the poster and supplement. One railroad posted the creed in each of its 1,200 stations. Managers of mining camps in the Rocky Mountains asked for and were supplied with this poster and supplement. In Chicago the circular was much sought after, eagerly read, believed and its teachings heeded by thousands who, without this knowledge, would have remained indifferent or opposed to vaccination.

DISCUSSION.

DR. B. V. HEDGES, Plainfield, N. J.—I would like to report some experiences we have had in Plainfield which bear on the paper just read, particularly as to the value of vaccination after exposure. One case occurred in one of our tenement-house districts, where there were eight men and women and three children in the household. The patient had been sick for four days before any physician had been called. He was promptly removed to an isolated building where he died the next day of the hemorrhagic form of variola. The inmates of the house were all vaccinated, except one man who made his escape before the doctor could operate on him. The result was that we had no trouble at all with the people who had been vaccinated, but two weeks later the man who had escaped was discovered at Allentown with a malignant type of the disease. None of the people referred to had been vaccinated before. In all of them the vaccination seemed to take, and, as I have said, none of them had the disease. The Allentown case was a most beautiful control experiment.

DR. H. M. BRACKEN, Minneapolis—I wish to endorse the paper in its entirety, and have little to say in the way of criticism because the sentiments expressed all through are practically my own. The fact of calling an operation that has not taken a vaccination has lately proved the source of a great deal of trouble. In our own state I recollect an instance of a rather striking character. An epidemic occurred in a little village. A capable physician went out and reported to me that it seemed like smallpox, but that if it was smallpox vaccination did not protect against the disease. That took me to the place as quickly as possible. I asked the physician whether he had seen the arms of the patients or had taken their word for the fact of their having been vaccinated. He said he had taken their word. In the first house I asked the mother of several grown boys as to whether they had been vaccinated. She replied: "No; not that I know of." The doctor said the boys themselves had told him they had been vaccinated. In another household the mother had said the children were

vaccinated. Two had smallpox and two had not. I asked to see their arms, and she added: "But these two did not take." In a third case we found a young man who had smallpox. I asked to see his scar, and he showed me a mark on the lower part of the arm. I remarked that it was a funny place to have a vaccination scar, and on examination I found it to be nothing more than the scar of an old boil. These are specimens of the histories we obtained. I have made it a point to ask health officers about cases of reported smallpox after recent vaccinations, and the result is that I have not found any cases where the vaccination had really been successful, though there have been several cases where the disease has followed old vaccinations. In Winona, where the disease was epidemic, the inspector reported that there were only a few cases of smallpox in which there was any evidence of successful vaccination, and in the most recent of these cases vaccination had been performed six years previously. Some of the patients had been vaccinated with some of that very poor lymph that was on the market for a time, and only a very faint mark was left. It was frequently found that one individual who had been properly vaccinated escaped the disease while others in the same household who had not been similarly protected became infected. In my opinion there is nothing more positive than the protection afforded by recent vaccination. Even smallpox itself is not more protective against the recurrence of the disease.

DR. D. E. HOAG, Brooklyn—I think the point as to many physicians not knowing how to vaccinate is a good one. Five out of ten practicing physicians may be said to be in this position. And what is worse, you have these men sent out by boards of health to perform vaccinations in a wholesale way. Their work is often done in a perfunctory manner, so many cases in an hour, and little attention is paid to asepsis or anything else. The act of vaccination is really a very delicate one and we have much yet to study and learn regarding it. My own experience, although limited to local work, has furnished me many contradictory results. I had a family of patients none of whom had ever been vaccinated. I started in with board of health vaccine. I tried it six times, but got no results. Then the family went to another physician, and it seemed to take all right, the result being that I lost my patients. As to the preparation of the arm, I would like to say a word. I have found some physicians who prepare the arm with bichlorid solutions, which I do not approve of. Others do nothing at all, and yet get good results. It seems to me important that we should at all events make the site of the operation aseptic, and that we should study the technic more than is done.

DR. H. D. HOLTON, Brattleboro, Vt.—I should like to have some further information as to the kind of scar that may be relied on to show that a person has been properly vaccinated.

DR. SPALDING—It is very difficult to say what constitutes a typical scar. There should be some discoloration. There should be pitting. The mark should be rather deep; a superficial scar is to be regarded with suspicion.

DR. HOLTON—Given a patient about fifty years of age who has not been vaccinated since childhood, would you not insist on a vaccination? Also: will you kindly state how you prepare the arm for vaccination?

DR. SPALDING—You can not be certain. Your best plan is to try it again. As to the preparation of the arm, you can use any ordinary disinfectant. Be sure, however, that the arm is washed with sterile water. I prefer a soda solution followed by alcohol. In regard to technic: about as neat a method as I know is to throw a drop of the vaccine on the arm before scarifying, and then rub it till the arm is red, but without bringing blood. I sometimes find sores as large as a quarter—I remember one case in which it was an inch square. These are altogether unnecessary, and are the things which bring vaccination into disrepute.

Bad Breath.—To remove offensive odors, such as are due to whisky and tobacco, E. J. Kempf (*Indiana Med. Jour.*) asserts there is nothing more effectual than 1 part of hydrogen peroxid in 5 parts of rosewater.

TWO CASES OF RETINAL DETACHMENT TREATED WITH SUBCONJUNCTIVAL IN- JECTIONS OF SALT SOLUTION.*

ROBERT L. RANDOLPH, M.D.

BALTIMORE.

I am aware that in speaking of the treatment of retinal detachment I am telling, so to speak, a story, the ending of which we can all pretty well surmise. But even negative results are helpful in getting at the truth of these matters, and I am not so sure but that they help us quite as far along the road as positive results. It is not necessary for me to review the history of this subject or to recall the fact that the treatment of retinal detachment might well be named failure. I shall go straight to the substance of this communication, then, without referring to the various methods of treating this affection. I have been struck with the results obtained by Dor, Winselmann and others when using subconjunctival injections of a salt solution. I put this treatment to a test in the following cases:

CASE 1.—The first case was that of an Irishman who came to the Johns Hopkins Hospital about two years ago. I found that his right eye had useful vision and that a cataract had been removed from his left eye. This operation had been apparently successful, but he had not retained vision longer than three months when detachment of the retina occurred, and this condition he had endured for eighteen months when he came under my care. With the exception of a triangle embraced between say 105 and 165 degrees with its apex almost touching the optic nerve the retina appeared entirely detached. He had light perception and nothing more. I put him to bed on April 20, 1900, and on that day gave him his first hypodermic injection of a syringe of normal salt solution. The injection was made as far as possible behind the corneal border. A compress bandage was then applied. The next day there was some redness near the point of the injection. He had experienced no pain. This treatment was kept up for a week, the injections being made every other day. During the second week a solution of the strength of six grains to the ounce was employed. The third week the solution was strengthened to ten grains, the fourth week to fifteen grains and the fifth week to twenty grains to the ounce. The injections, as usual, were given every other day. After the first week there was always a marked reaction which increased objectively and subjectively in proportion to the amount of salt in the solution. During the third week the pain was severe and lasted for an hour after the injection. During the week when the solutions were of the maximum strength the pain lasted for several hours and the conjunctival congestion was very intense. The patient was never allowed even to sit up. An ophthalmoscopic examination made at this time showed the retina in place but, with the exception of the triangular area which was originally attached, no part of the fundus gave back a clear red reflex. He could now count fingers at two feet. It was my intention to persist in the treatment, using each week a stronger solution, but he declined to remain inactive any longer and he left the hospital at the commencement of the sixth week.

CASE 2.—The second case was a particularly favorable one for testing the value of the treatment. J. L. T., forty-one years old, came to me on June 2, 1901, with the report that the day before he had noticed a veil pass suddenly across his sight and since then he had only been able to see indistinctly things above the level of his own head. Examination showed a detachment of the retina which, roughly speaking, took in more than the upper half of the retina. This condition had occurred the day before, but four days previously he had been troubled with a dimness of vision in the eye. He had a myopia in this eye of about five diopters. It is rather interest-

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