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For instance, a moderately healthy person, actively engaged in out-door pursuits in winter (or undergoing much mental strain, as well as muscular waste), requires or does well with meat at every meal. Such an one may in summer be well satisfied with the substitution of cereal food and fruits and a very moderate use of meat—say, at one meal each day—if that person is not required to or does not voluntarily perform active muscular exercise in such hot weather.

Apply the same rule to the consumptive's diet, and some, but a lesser, variation to fruits and starchy foods would seem to be advisable, because we can never lose sight of the greater proportionate waste of tissue and the poverty of blood in this class.

It has been said that "the majority yield to inclination rather than be guided by intelligence and judgment." Hence the great importance of this food selection question to the consumptively inclined, whose inclinations are so often pulling against their better judgments. The author will feel amply repaid if the foregoing plan of battle, though imperfectly presented, shall aid invalids to conquer or keep this foe—tuberculosis—in check, and the doubtfully affected to follow a line of duty which shall enable them to avoid the necessity of an actual contest.

TUBERCULOSIS AMONG THE INDIANS.

H. R. BULL, M. D., GRAND JUNCTION.

The material for this paper was gathered during an experience of five years as physician to the United States Indian School at Grand Junction. During this period, the average number of pupils in attendance has been about one hundred, ranging in age from eight to twenty years, the average age at time of enrollment being about twelve years. These pupils were gathered from the various reservations and were chiefly Mojaves from Southern Arizona, Mescalero Apaches from Southern New Mexico, San Carlos or White Mountain Apaches from Southeastern Arizona, Navajos from the adjacent portion

of Northeastern Arizona and Northwestern New Mexico, and Utes from Utah. It is the intention of the Indian Department of the Government to keep these pupils in school for a period of six years, giving each one a practical education and trade. In selecting these children at the agencies, some care has been observed in the past, and, upon arrival at the school, they have all been carefully examined for the presence of cutaneous or venereal diseases before being allowed to mingle with the others at the institution. During the past year, these children have been selected with even more care than formerly, and, upon arrival, note taken of the height, weight and pulmonary expansion, in addition to the former examination, so that each pupil has a physical record from the day he enters the school. The general sanitary conditions of the institution are good, and the changed condition of life with the average pupil as great as could well be imagined—from tepees to dormitories, from nakedness to clothes and regular meals. Tuberculosis among these children has invariably been secondary to some local suppuration, inflammation or caries. During the past four winters we have had "La Grippe" in epidemic form, which was particularly severe during the winter of 1892 and 1893, confining to bed at one time in February, 1893, twenty-five boys and fourteen girls, and being followed, in many instances, by its insidious sequelæ of bronchitis and enfeebled and lowered vitality, suitable conditions for the development of tubercular lesions. The more remote causes for high mortality from tuberculosis among these children depends upon an inherited susceptibility to weakness of glandular and mucous surfaces. The Indian of to-day is in a transitory state, between savagery and civilization, either of which would be more favorable to health than the present condition. Living a nomadic life, and wandering over unlimited territory, contrasts strongly with living within the confines of a reservation, on government rations largely and under the most unsanitary conditions imaginable. Formerly, also, new blood was frequently infused by marriage with women captured in raids on other tribes. Now, in the individual tribe, being often numerically small, there is a tendency to consanguinous mar-

riages, thus perpetuating the same line of diseases, notably tubercular and syphilitic. Further, Indian girls are sold into marriage before the advent of puberty (which occurs from twelve to eighteen months earlier than in white girls in the same latitude), and become mothers before physical maturity. In fact, menstruation is regarded by most tribes as dependent upon the marriage relation, and girls in camp will conceal and deny the flow if it occurs before they have been sold in marriage. I present these facts and conditions because of the large mortality from tuberculosis in this institution, which, in a similar institution filled with white children, would appear culpable. It is of interest to group these children according to the various tribes from which they come and note the appearance of tuberculosis in each. Taking first the Utes, who are the most robust children in the institution and whose reservation climate is similar to that of the school, and it is a remarkable fact that not one of these children have contracted tuberculosis primarily in the institution. Prior to 1882, Mesa County was a portion of their reservation. There are twenty-eight of these pupils in the school, one on them—F. L., a male, aged twenty years—had a neglected tubercular arthritis of the knee, while on the reservation, before coming to the school, and an amputation was performed by Dr. Pinkerton, of Salt Lake, where he was taken for treatment. This boy developed a tubercular arthritis of the right wrist after attempting to learn harness-making in the shop at the school, but was cured by the persistent use of plaster of Paris casts and injections in abscess cavities with an emulsion of iodoform in oil. A year has now elapsed since the treatment was suspended, leaving partial ankylosis and some weakness. The Navajos, numbering sixteen thousand on the reservation and occupying the adjacent portions of Northeastern Arizona and Northwestern New Mexico, are represented in the school by fourteen pupils. These children I regard as next to the Utes in point of health and physique. The climatic conditions at home, being almost identical with our own, I believe, has important bearing upon this relative immunity. We have had one case of pulmonary tuberculosis from this tribe. This case

was J. T., male, aged about twelve years. Both parents dead; cause unknown. He had "La Grippe" in January, 1892, followed by persistent cough and evening rise in temperature. The sputum, on examination, revealed the presence of tubercular bacilli, early the following March, and he was returned to the reservation on April 10, 1892. Advice from the agency informs me that this boy has made a complete recovery, it now being over two years since he was returned.

The Mojave tribe number about eight hundred and inhabit a reservation in the warmest part of Southern Arizona. We have seventeen of these children, and out of this number five cases of tuberculosis. Case 1—E. A., male, aged about sixteen years. Father and two brothers died of consumption; mother living. He had "La Grippe" in February, 1892, and subsequently profuse hemorrhages were the first warning of phthisis. He was returned to the reservation April 10, 1892, where he died a few weeks later. Case 2—Argarutha, male, aged ten years. No parents, or history of any. Returned to the reservation October 16, 1891, for tubercular peritonitis, where he died a month or two later. The first evidence of trouble in this case was an obstinate dysentery during the summer of 1891. Cases 3 and 4 died of pulmonary consumption in the institution. Case 3—a female—had broncho pneumonia, following measles, in July, 1891, from which she never fully recovered. Case 4 had "La Grippe" in 1892. Case 5—D. D., female, aged twelve, an exceptionally bright child, the daughter of a chief. After "La Grippe," in February, 1892, grew listless and lost weight. Examination of the sputum, the following April, revealed tubercular bacilli and physical examination revealed apical phthisis. This child, I am pleased to report, made a complete recovery, following a trip to the Grand Mesa and a free, out-door life all summer. She is now one of the most robust girls in school.

The Mescalero Apaches are a small tribe, numbering seven hundred and fifty, from Southern New Mexico. We have had eleven of these children in the school, among which four have been tubercular. Case 1—H. H., male, aged about fifteen. Mother living, father dead; cause not known. Had pneumonia

on the reservation, and again in January, 1893, while in school, after which pulmonary tuberculosis developed, terminating fatally four months after his attack of pneumonia. Case 2—Numa Raymond, aged about twelve. Father consumptive, mother dead; cause of death not known. Had "La Grippe" in December, 1891, followed by cervical adenitis. These glands rapidly suppurated and remained ulcerated, refractory to treatment. One year later, the axillary glands also broke down and ulcerated, together with a large area over the anterior chest wall. During this entire period, the boy's general health was good, and occasional examinations revealed no pulmonary infection. Last summer, under persistent and prolonged hot baths and iodoform dressings, with arsenic pushed internally, the ulcers began to close in rapidly, and by October had nearly healed. He then developed acute tuberculosis of the lungs, which ran a fatal course in seven weeks. Case 3—female, aged about ten years. Family history negative, except that her father was a renegade and died in prison. In February, 1894, she was called to my attention on account of loss of appetite, failure in flesh with afternoon and evening temperature. Repeated examinations revealed only two enlarged axillary glands to account for this. The temperature persisting, I operated for removal of these glands, on May 1st, and explored the axilla thoroughly, removing eleven tubercular glands. In two days her temperature fell to normal, and she has every appearance of having recovered, although less than two months have elapsed since the operation. Case 4—P. D., male, aged about fourteen; family history negative. He came to the school in June, 1891, and had measles the following July, and "La Grippe" in January, 1892. Tubercular bacilli were found in the sputum the following April. He was sent, with others, to the Grand Mesa for the summer, and returned in the fall, having regained his health. He is still in the school.

The San Carlos or White Mountain Apaches from Southern Arizona number about thirty-five hundred. This, it will be remembered, was the tribe of the renegade chief Geronimo. We have had thirty-three children from this tribe, and six of them

tubercular. Rather singularly, all these cases were females. Case 1—Gretchen Tamiens, aged about thirteen, family history negative—was reported to have had pneumonia on the reservation before coming. At any rate, the skin over her chest was covered with scars where lacerations had been made by the native medicine men with sharp shells used for such purposes. She had "La Grippe" in December, 1892, and died in the institution in May, 1893, a typical case of acute pulmonary tuberculosis. Case 2—Hannah Nelaha—had tubercular peritonitis, proving fatal July, 1893. The immediate cause of death was a perforation through a tubercular ulcer. This case ran its course in about four months, and at the autopsy the entire peritoneum was found studded with tubercles, the lungs revealing no tubercular infection. Cases 3 and 4 were found to be tubercular early in the spring of 1892, and were returned to the reservation April 10, 1892, where they since have died. Cases 5 and 6 were among the number down with "La Grippe" in February, 1893. In April they were diagnosed as tubercular, and the diagnosis was confirmed by staining the sputum. They were returned to the reservation on June 24, 1893. One of these girls died since her return. From recent information I learn that the other has made an apparent recovery. The fatal case had, in addition to "La Grippe," in February, 1893, a moderately severe attack of diphtheria the following month, which necessitated confinement and isolation. This covers all the tubercular cases of the school during a period of five years, making a total of seventeen cases, with eleven fatalities. In two of these cases, general infection did not take place, and two were cases of tubercular peritonitis, leaving thirteen cases of pulmonary tuberculosis. Of this thirteen, nine have proven fatal and three, probably four, have recovered.

We may make the following deductions from the cases reported: First—That the mortality from tuberculosis has been in direct relation to the amount of climatic change between the reservation and the school. Second—That in cases of localized tubercular deposits, not removed by operation, general infection is especially liable to follow. Third—That the fatal

cases mostly following "La Grippe" have been acute and ran a rapid course, averaging only two or three months.

The important factor in preventing the spread of this disease in an institution, consists in making an early diagnosis, in order that disinfection of the sputum may be accomplished, and, at least, isolation from the other members of the school while in doors. These children are mostly very reticent in making any complaints, and the difficulties of reaching a case in its incipency, by ordinary means, correspondingly increased. Consequently, after our first epidemic of "La Grippe," in the spring of 1892, we commenced weighing all the pupils the first of every month, and, by comparing the weights of each one, month by month, any marked decrease was sufficient ground for suspicion, and the child subjected to a thorough physical examination. In case there was any evidence of incipient phthisis, the sputum was stained and examined for bacilli, using for this purpose chiefly, Dr. Gibbs' double stain on account of its greater simplicity. By this means, a positive conclusion was reached in some instances when the physical exploration was doubtful, and under any circumstances it is a source of satisfaction to have the diagnosis confirmed in this way. The infected pupils have been removed from the school-room and dormitories, given separate sleeping-rooms, which have been disinfected and fumigated before being reoccupied by others; sputum being destroyed by fire as much as possible by burning paper holders. A separate table in the dining-hall was reserved where appropriate diet was furnished. The systematic recording of weights was continued among the tubercular cases as well as the others, and has constituted with me one of the chief factors in judging the degree of improvement or failure. Dust, laden with tubercular bacilli, being recognized as one of the means by which this disease is spread, I have recently directed that all halls, stairways and dormitories be wiped with a damp cloth instead of swept, as was formerly done. The school is in no sense a hospital, and it is the policy to return to the reservation all infected pupils. The exceptions to this rule are only where, from a humane standpoint, it seems best to allow them to

remain, because of having no one to go to on the reservation. Of the medicinal treatment of these cases I have nothing to say, except to note, as a curious fact, that the stomachs of at least one-half of these aborigines would not tolerate cod-liver oil. In conclusion, no treatment of these cases has been of avail which has not been associated with out-door life, and, especially in summer, the mountain air. They bear confinement badly, much more so than white children.

DISCUSSION ON THE SYMPOSIUM ON TUBERCULOSIS.

DR. MELVIN—I would like to ask Dr. Bull if he has made any comparison, or does he know anything of the cases that result fatally in the reservation; also, if tuberculosis is prevalent among the Indians in their native state, or whether coming into civilization has made any difference.

DR. STUVER (RAWLINS, WYOMING)—I have been much interested in the papers that have been read this afternoon, and have been impressed with the importance of the subject. There are a great many factors that go to make up the relation of physical organization to the causation of tuberculosis, and in order to understand and prevent the disease, we must take a very comprehensive view of these various factors. Dr. Oliver Wendell Holmes once remarked that, in order successfully to cure this disease, we should commence treating the patient two hundred years before birth. Now, I think this idea can be taken into consideration and very beneficially applied in handling tuberculosis. I believe that prevention, in tuberculosis, is of far greater importance than treatment, and I am convinced that, if the manner of life and the management particularly of those children who are susceptible to tuberculosis, were given proper attention and they were brought up, from their birth, in accordance with physiological principles, they would be proof against this dread disease. Nor is this the only factor in the early prophylaxis of the disease. I think that great improvement can be made in the methods of managing children during

school life. In the first place, they should have longer recesses, and should be protected against the nervous excitement to which so many of them are subject. The ordinary cramming methods and preparation for examinations, so prevalent in our schools, should be replaced by instructions based on the laws of mental growth and development. This subject, as brought out by Dr. Denison, strikes at the root of the whole question. What we want to do is to build up the earlier vitality or activity of the system, so that it will be able to resist the invasion of this disease. Let it be due to the bacillus tuberculosis, or whatever it may be (it is claimed by some to be of nervous origin and by others to be caused entirely by this bacillus). If the system is built up and is in proper condition, I consider there is very little danger of tuberculosis.

DR. FINNEY — In reply to the doctor on my left (Dr. McLean), I wish to add a few words of my experience with the Indian tribes on the reservation. During the years 1882, '83 and part of '84, I was government physician at the Quapaw Indian Agency. Under that agency, there were eight tribes, or rather remnants of tribes. Among them, we had the Modocs, who were the remnant of the tribe brought from Northern California and Oregon, and I can say, in regard to the prevalence of tuberculosis among these Indians, that the majority of deaths, while I was there, among adults and children, was from tuberculosis, and I can bear out what Dr. Bull says as to the length of time that the disease ran. They were acute cases, the majority of them, and my recollection is that nearly all of them were cases of pneumonia, followed by galloping consumption. I have been very much interested in all the papers on this subject, and while I am located, as the most of you are, in Colorado (I come from the southern part of the State), I can not help being struck by the reference Dr. Hershey made in regard to the feeling of exile among the patients who come from their Eastern homes; and, in this connection, I wish to commend the efforts of the philanthropic association known as The American Invalid Society of Boston, who are sending out consumptives and their families to Colorado and New Mexico, with

the idea of locating them permanently. We have in our section of the State quite a number of patients sent out by this organization. They have been aided in getting West and locating, and in getting a start in life in this glorious climate. From what I have seen of it, it is certainly a humane and beneficial plan, and perhaps the one best calculated to permanently benefit the class of consumptives who have but small means.

DR. MUNN—I had the pleasure, a month ago, of taking part in a symposium on phthisis before The Pennsylvania State Medical Society, and I was surprised there to find the sentiment expressed by some that consumption is a hereditary disease, transmitted in genesis from parent to child. I there took the stand that children acquire tuberculosis because they live in the same house with infected persons and because they are thus brought into contact with the disease germs, and I made the statement that in Colorado the rising generation of healthy, robust children of formerly tuberculosis patients were a living argument against the fallacious belief in the heredity of tuberculosis. I would like to have an expression from some of the gentlemen who have lived in Colorado long enough to have an opinion on this point.

DR. DENISON—I would like to say something about all three of these papers, but this discussion has come so late that I will have to confine myself chiefly to Dr. Manley's paper. It seems to me that the evidence of a pre-tubercular stage is a very important matter. If we admit that there is a pre-tubercular stage, the question immediately arises: When does it first make itself manifest? Is it not, of course, before the advent of the bacillus of tubercle? There are many facts and considerations which lead us to conclude that the bacillus is rather a result than a cause of this condition—*i. e.*, that there is a condition of the blood which favors, in fact, may be a necessary prerequisite, for the growth of the bacillus of tubercle. I am myself much inclined to venture the prediction or belief that tuberculosis becomes possible in a given individual because his leucocytes fail to do their work of cleansing the blood. Whether this is because (1) of lack of elimination of mal-products they have

too much to do, (2) because they are too few in numbers, or (3) because they are themselves diseased (an abnormal leucocytosis), is yet to be determined. If this is the case—if we go back to the leucocytes for the inception of the tuberculosis—then the condition of the blood is accounted for which favors bacillary growth, and the bacillus of tubercle is not, as is generally believed by medical men, the cause of tuberculosis. I could say a great deal on that point, but the lateness of the hour will prevent. I will only say, in reference to Dr. Solly's paper, that I will go still further than the doctor goes as to the relation of nasal obstruction to lung disease. If we make use of the manometer, to illustrate how little suction influence will hold together the sides of the nose when once they are closed during inspiration, we see that it takes very little to keep up this closed condition—*i. e.*, three to ten m. m. The suction power of the lungs is about fifty m. m., one-half of what the expulsive power is. Under nasal obstruction, the compensation for this suction influence is in the pulmonary capillaries and air cells, when blood stains and congestions may result. The pressure of the air is the question that settles it. A very little obstruction in the nose during sleep, when the system is under relaxation, is enough to influence the pressure of the air on the lungs, and thus a great many of fibroid pneumonias and like diseases are promoted or kept up when once inaugurated by colds, influenzas, catarrhal conditions, etc. I go still further than the doctor goes, and will say that non-tubercular lung diseases, chronic pneumonias, the retractions of pleurisy, asthma, etc., are very largely associated with nasal obstruction to respiration.

DR. H. R. BULL—In reference to the question of the amount of tuberculosis on the reservation, I can only tell in a general way from those children that come under my observation, and who are familiar with their family histories; but I understand that a higher mortality prevails among the tribes on the reservation than does in the institute. In regard to the proportion of deaths from tuberculosis in the institution and deaths from other causes, there have only been two deaths during the past five years from causes other than tubercular.

I have taken the trouble to look over statistics of other Indian schools, and I find that they have even a higher death rate than the institution in Grand Junction. Further, they have not taken the pains to report the cases sent home in a more or less advanced stage of tuberculosis.

THE NEW MOVEMENT IN DRESS REFORM.

DR. MARY E. BATES, DENVER.

I have written no paper on the subject, as I simply intend to bring to your notice the new movement in dress reform from a clinical standpoint.

You are probably aware that a club for the purpose or encouraging rational dress for women has been organized in the city of Denver. You probably (although you may have read some newspaper reports of its movements) are not familiar with the true facts in the case. A new idea always carries with it a prejudice against that idea. Men are apt to form conclusions without any knowledge of facts. Women do the same; but women, as a rule, are more conservative than are men.

Women in the medical profession (and to you this may seem astounding) are more conservative than men. As physicians, you certainly should know how women have been dressing. I will submit, however, that a great many of you do not. Those of you who do know have probably paid very little attention to the matter and have cared less how they dress. Some of you do not even care whether they look well or not.

Those of you who do not know how women dress at present will be surprised to hear that most women carry the weight of their clothes from their hips, and compress their waists to an abnormal extent. It may be that some of you have heard of this before! All who have thought anything at all about the matter know that this condition of the compression of the waist is an extremely pernicious one. It is one of the most fruitful causes of disease that we can mention, and, with the suspending of the weight of the skirts from the hips, is the cause of much