SOME NOTES ON THE TREATMENT OF PHTHISIS IN COLORADO: WITH ILLUSTRATIVE CASES.¹

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IN presenting this subject for the consideration of the meeting this evening, I am well aware that it is so vast a one that we can hope to touch upon but few of the prominent points and must necessarily leave much of the details unconsidered; and further, that the class of cases to be considered are so common with us, by virtue of our becoming a refuge for those affected with pulmonary disease, that the thoughts to be presented may seem trite and threadbare. In regard to this latter point, if indeed it be necessary to urge any extenuating reason for presenting this subject, I can but say, that while I have frequently conversed with one doctor and another in regard to the cases of phthisis under his observation I have never, during a six years' residence in this State, listened to an article upon the subject in either the local or State society,—due, no doubt, to the fact that common-place and everyday events are deserving of but little notice, and that we see so much of phthisis in its several stages of decline, arrest or cure, that it may seem as though there were but little of interest to be said on the subject.

However, as I look around the assembly and see the number amongst those of us present who I know have come to this State on account of some pulmonary difficulty, and who having found a restoration of health, have said, "Here am I and here will I abide," I cannot feel that the discussion will be devoid of interest and I am conscious that the utmost that I can attempt is to formulate a few ideas which will serve as a theme for the discussion.

There will be found those amongst us who will agree with Flint that: "There is no such affection as a non-tuberculous pulmonary phthisis," and on the other hand there may be those who hold to Niemeyer's theory, backed by the researches of Virchow, that phthisis is frequently catarrhal in origin. Some will believe that Koch and others have proven beyond a doubt that the *bacillus tuberculosis* is the unfailing cause of phthisis pulmonalis, and others are still holding their decision in abeyance.

It is not my intention to even touch upon these disputed points, but rather to treat of the subject in terms which, we shall probably all agree, give evidence of pulmonary phthisis and to cite cases as types and by way of illustration of what I wish to say of the selection of cases to which our climate is adapted; the kind of cases from which we may expect the most favorable results; the precautions that must be observed in order to obtain these results and considerations of a like nature.

We recognize, for instance, a stage of incipency in phthisis characterized by loss of strength and weight, cough, more or less difficulty in breathing, more or less expectoration of a glairy mucus, fever, increased frequency of the pulse, night sweats, hæmorrhages, and the physical signs of dullness on percussion, broncho-vesicular respiration, bronchophony, prolonged expiration, and it may be the development of fine subcrepitant râles.

It is not necessary that all of these symptoms should be present in order to justify a diagnosis, any more

than it should be insisted absolutely that typhoid fever can never exist without diarrhœa or petechiæ.

Experience has demonstrated that the progress of such cases, if remaining in a moist, low climate, where there is a small percentage of sunshine, is from bad to worse. These are they who form the recruits to the annual mortality of 100,000 persons who die of consumption in the United States. On the other hand, we of Colorado can certify to the vast numbers of recoveries that have occurred amongst invalids coming to this State with symptoms indicative of incipient phthisis.

We have among our citizens not a few who were sent to us because of a consolidation of limited extent at one apex, evidenced by dullness on percussion, a prolonged and blowing expiration, the development of a few fine subcrepitant râles, it may be produced only by cough with deep inspiration, the physical signs being attended by loss of strength and weight, night sweats, cough, especially on going to bed and on arising in the morning, or at least by a constant hacking, and more or less expectoration of a glairy mucus. Such cases may or may not have had one or more hæmorrhages and they may or may not have a family history of an hereditary phthisical taint. Although it cannot be claimed that a residence in our climate is an unfailing cure in such cases, yet the numbers of cases is so great as to warrant the assertion that the Colorado climate is admirably adapted to persons suffering from phthisis in its early stages.

Let me cite a few cases by way of illustration and selected with reference to the varying conditions existing.

CASE I. On the 26th of October, 1884, I examined a young man, twenty-one years old, who came from New England with a history of having lost a brother (twenty-two years old) and a sister (sixteen years) of consumption, and having another sister (sixteen years old) sick with consumption — of which disease she died over a year ago. He had always shown a tendency to colds; and in order to throw off this tendency, he had been to Florida, and had also been on a sailing-vessel to Japan. When I examined him he was troubled with a dry, hacking cough, as though there were a constant irritation in his throat. He had indigestion, flushed cheeks, elevation of temperature in the afternoon, rapid and excitable pulse, and a physical examination revealed: expansion, two and one-quarter inches; percussion dull at left apex; auscultation, prolonged and whispering expiration at left apex, with a click or two on cough, with deep inspiration.

To-day this man is entirely free from any cough or hectic. He is living at an elevation of about 8,000 feet, and doing a man's work, and seems well in every respect.

CASE II. On May 1st, 1885, I examined a young man, twenty years old, who had been a jeweller in New York, and who gave the following history: No hereditary taint; he himself had always been healthy, save for a nasal catarrh. In June, 1884, he caught a bad cold, had night sweats constantly, and lost flesh and strength. When I examined him he was very short of breath; coughed, especially in the morning, raised a thick, tenacious sputum, and his voice was decidedly husky. Physical examination revealed dullness at both apices, a broncho-vesicular respiration, bronchophony, and the presence of some fine râles at the left apex.

¹ Read before the Denver Medical Society, December 7, 1886.

This young man has been at work as a machinist almost constantly since he came here. His cough has disappeared; his hoarseness has almost gone. He has gained fifteen pounds in weight. He is strong and well, and shows but little evidence of ever having had any pulmonary difficulty.

The two foregoing cases are average ones; we could find the like on all sides. The one showed signs of incipient phthisis, complicated with a strong taint; the other of incipient disease of both apices, without any taint. Neither of them was hæmorrhagic. As an illustration of the latter condition, let me cite the following:

CASE III. Came to Colorado some nine years ago with a prognosis from an eminent specialist in the East that he could not live six months, because of his hæmorrhagic tendency. For five years he was entirely free from hæmorrhages, and for a good part of the time was able to earn his own support. Finally, in March, 1882, after a hard day's work, he was taken with a hæmorrhage, which was followed by one or two more. He was kept perfectly quiet for several weeks. When he was able to be about again, he one day, about the middle of June, rode horseback twenty-five miles in the afternoon. The next morning he rode the same distance back. The day following he took a long journey by rail, and the day following that he rode horseback some thirty miles. On this followed a slight hæmorrhage, and in about a week afterwards, after some indiscretion, a very profuse hæmorrhage, for which I was called to see him. This was in Estes Park, at an elevation of 7,500 feet. There was some consolidation at the left apex. I speak without notes. I could not find any trace of cavity, and there was no hereditary taint.

Under care, he recovered, so that he gained strength and weight wonderfully. Was able to ride long distances before the summer was over, and since then he has rid himself of his cough; has lived in Leadville, an elevation of over 10,000 feet; went East for several months one summer and autumn, and seems to be in a fair way of living to a good old age.

It may, however, be argued that this is an unusual case. While I think that many like it could be cited, perhaps the following will come nearer being the typical one:

CASE IV. Was one of the few survivors of the "City of Columbus," that went down in Vineyard Sound on her way from Boston to Savannah in the winter of 1884. He, at that time, contracted a cold which clung to him, until in March of the same year he had a hæmorrhage. This was followed by night sweats, loss of weight and strength, and dyspnoea. In August he had a second and profuse hæmorrhage. I examined him August 24th, 1884, and found that his father had died of consumption at the age of thirty-two years. In other respects his family history was good. At the time of examination he suffered from shortness of breath, cough, especially in the morning, a considerable thick, yellowish expectoration; and on physical examination, I found an expansion of two and one-quarter inches, dulness at the right apex, and a few fine, moist râles at the same apex. I have now lost track of this patient, but for many months he gained in every particular, and had had no recurrence of the hæmorrhage.

There are cases that are not so far advanced as those cited, where speedy and great good is received

by coming to our climate. By way of example, let me cite the following:

CASE V. A young man about entering college. Age, twenty-one; comes of a long-lived race. In June, 1886, noticed an invariable morning cough, which grew worse in July. Expectoration greenish-yellow and tenacious. Loss of strength, but no night sweats.

Physical examination made September 18th, 1886. Expansion, three inches; percussion slightly high at the right apex; auscultation, fine, moist râles developed with cough, and deep inspiration over supra-clavicular and supra-spinous regions on the right. Pulse, 40, temperature 99.4°.

This young man has so far recovered that he has, within a few weeks, taken out a life-policy in one of the best insurance companies in the country, the examiners for which are members of this Society.

When the disease becomes more advanced, and larger areas of lung tissue than the mere apex became involved, even then, in a good number of cases, the results are excellent from coming to Colorado. A most marked instance is the following:

CASE VI. A young man, aged twenty years, living on the New England coast, and working in an office, contracted a cold in the early months of the winter of 1881-82, which hung on him until he came to Colorado in March, 1882.

At that time I found family history good. Had lost nineteen pounds in weight; lost strength. Was having constant cough; expectoration muco-purulent and abundant. Marked shortness of breath; hectic. Physical Examination: Percussion note high over the right upper lobe, and abundant fine, moist râles over the same.

His digestion was excellent, and his recuperative powers great. Of all the patients that I have had under my care, I have never had one so rational, nor one who took such good care of himself as he. From the minute that he put foot in Colorado, he began to improve. Life in the open air, sleeping in a tent, and work on a ranche in the San Luis Park made a broad-chested, muscular, powerful man of him, and to-day he is living, in perfect health, in one of the most trying climates on the globe, that of the eastern coast of Massachusetts.

There are cases, where the development of phthisis may well be feared from the fact that a pneumonic product is slow in being resolved, or a pleuritic affection, with adhesions, may produce an irritation which will result in fibroid phthisis. Such cases have been found to do admirably in our climate.

The following illustrations will serve as types.

CASE VII. A young medical student, in Boston, of excellent family history, but with a personal history of two previous attacks of pneumonia, was put to bed early in April, 1880, with a rapid pulse, a temperature of 104.5°, pain on the left side in the region of the nipple, cough, and expectoration which never became "rusty"; also night sweats were present. There was found to be a limited area of dulness near the left nipple, and râles. The diagnosis was made of an acute catarrhal pneumonia. The trouble proved to be asthenic. After four weeks he was sent into the country, then into the hills of Maine, and afterwards into the White Mountains. Although he gained in strength so that he played tennis, climbed mountains, and did all sorts of foolish things, yet the consolida-

tion remained and was accompanied by a constant cough and abundant muco-purulent expectoration. In October of that year he was sent to Colorado, being adjudged an "unfavorable case." For two years he practised his profession, in a desultory way, and lived constantly in the open air out on the frontier. In the fall of 1882, he saw the late Dr. Austin Flint, who examined him then for the first time, and pronounced one lung as good as the other, and to-day, or rather this evening, he is the reader of this paper.

CASE VIII will illustrate the pleuritic condition of which I spoke.

Mr. X., of the Massachusetts coast, aged twenty-eight years and with a family history of having lost a sister, a maternal uncle and the maternal grandfather of consumption, was attacked in September, 1884, with pleurisy of the left side, which confined him to the house for three or four weeks. He came to Colorado in November, 1884, and was having night sweats. He had lost flesh and strength, but he had never had a hæmorrhage.

I examined him in March, 1886, and found that he was coughing a little, was raising a slight amount of thick, tenacious sputum, and that, on a physical examination, there was a slight area of dulness with some fine râles at the base of the left lung, in the axillary line. The signs were aggravated in his case by an irregular life. He has since then done admirably and went East for the summer. I have not seen him since.

But, gentlemen, I will not weary you by the citation of cases that serve only as familiar types to you all. There is probably not a practitioner here but that could match any one of these that I have presented by many others from his own experience. Before, however, proceeding to some general remarks on the treatment of the disease, I wish to record a case of growing recovery from a chronic laryngitis, consequent upon a phthisical condition.

CASE IX. Bostonian, thirty-five years of age, corner. Noticed tickling in his throat and a dry hacking cough in August, 1884, which continued until January, 1885, when he had a general breaking-down, but has never had a hæmorrhage. In February, 1885, he went to Minneapolis. He spent the summer months in the pine-woods of Wisconsin and came to Colorado in November of 1885. He used, he says, to expectorate a teacupful of muco-purulent sputa every night, and he had fallen in weight from one hundred and thirty-five to one hundred and twenty-five pounds.

About December 1st, 1885, he had lost his voice. He could only speak in a whisper that could be heard only a few feet, when about September 1st, of this year, under the stimulus of a life out-of-doors day and night, and local treatment, to tone up, if possible, the dilated bloodvessels of the parts, he recovered tone in his voice and to-day, absolutely free from cough and expectoration, in possession of strength so that he can do a hard day's work, and with a voice somewhat husky, but strong enough, as he says, to be heard half a mile, he is anxious to go back to Massachusetts and spread the good tidings of the efficacy of the dry, bracing, Colorado air in the cure of many phthisical conditions.

It is not to be contended that our climate is the be all and cure all. We can number too many cases that have come in the advanced stages indicated by emaciation and cavity, and have speedily given up their lives

here, to feel that it is sanative in all phthisical conditions. To be sure we can cite cases that have, even in these stages, prolonged life for months and years; and yet, most of us will probably agree in the assertion that this rare, elevated air is contra-indicated in the so-called third stage of phthisis.

Moreover, in every case, be the trouble great or be it little, the advice and direction of those experienced in the treatment of the disease are aids.

We know, perfectly well, that some cases will do well in one portion of our State and others in another. We know that it is essential to give directions in regard to all hygienic measures, to specify in regard to the minutest details of life, even to make inquiry into the methods of clothing, the diet, amount and manner of exercise, the sleeping accommodations, the hours of sleep, etc.

We know that it is a mistake for persons to come to Colorado and shut themselves up in an office or with indoor work. We can each of us recount the sacrifice of life that has been made, in case after case, by an undue haste to be at the work of life again.

If there is any one thing that we should harp upon to our patients, it is caution. Caution not to exercise too much, especially at the first. Caution not to sleep in an illy-ventilated room, nor in a draught. Caution not to catch cold. Caution not to keep late hours, not to smoke too much or perhaps not at all, and caution not to do this thing or that thing. An exceeding watchfulness is the price of a recovery, and if we expect to obtain good results we must be specific in our details to a degree that it is often wearisome. As I look back upon my cases, I can recall a fatal termination due in all probability to a fishing excursion; another due to a desire to earn a living in a counting-house; another to undue exercise in climbing hills while surveying; another to taxing the strength too greatly by lifting, etc. Even in those cases in which a recovery eventually occurs there are apt to be some set-backs. An imprudence in playing tennis, or riding horse back, or in dancing, or taking part in theatricals, not to speak of the more earnest walks of life, not infrequently causes dangerous and trying exacerbations of the disease.

It sometimes happens that a mental despondency will interfere in cases that, so far as the symptoms, history and physical signs are concerned, warrant a favorable prognosis. I recall one marked case where a young man, having some consolidation at the right apex, which extended down into the upper lobe on the right, was so depressed by the death of his wife, which happened while he was *en route*, and knowledge of which was kept from him for some time, that he sank steadily although his physical condition warranted at least a guarded prognosis.

The one thing that I insist upon in the cases just come to our climate, is rest. So much do I harp on it, that I often tire of the repetition. I urge comparative inactivity for some time after coming here. How often do I tell such patients to exercise short of anything like fatigue, to walk but moderately, and to spend most of the hours of sunshine in some corner on a veranda, where they will be sheltered from the wind and be basking in the sun. The altitude of one mile above sea-level gives the diseased and unaccustomed lungs all that they can properly attend to, without putting upon them the additional work caused by over-exercise.

As regards medication I have but little to say. The treatment is *pro re nata*, so far as drugs are concerned. My rule is to give absolutely none, unless there are very decided and positive contra-indications. My belief is that rules that hold at sea-level with reference to alcoholics do not appertain *in toto* at this elevation. It is often a nice point to determine whether to continue the daily doses recommended by eastern advisers.

Where the stomach will digest it, I find cod-liver oil, either pure, or in an emulsion, of great advantage, and yet even this should be exhibited with caution. In perhaps the larger proportion of cases my advice is in regard to general regimen rather than in regard to the administration of drugs.

Gentlemen, the large percentage of our population that is composed of the invalid class who have found a recovery in this climate and have pitched their tents here, is the most potent argument in favor of its efficacy. We know that we are blest with the great climatic conditions of a dry atmosphere, a rare and pure atmosphere, an amount of sunshine that is unrivalled and high sun-temperatures.

We know that these factors, the absence of endemic phthisis, and a dry soil are strong arguments in favor of this being a curative climate. We know, further, that an out-of-door life is possible during more hours of the day, and during more days in the year, in this climate, than in almost any other on the face of this earth; but the most conclusive testimony to be found, as regards the curative influence of a life in Colorado, in cases of phthisis pulmonalis, is in the thousands upon thousands of people who can, in their own persons, bear testimony to the fact.

At least one hundred thousand people in these our United States die every year at the hands of this fell disease.

Does not our duty, not to ourselves but this large invalid class, compel us to proclaim far and wide, the efficacy of the cure to be obtained in the Rocky Mountain region; to point out the cases that can reasonably expect a benefit; to implore the eastern doctors not to take us as a *dernier resort*, and, finally, to devote our best energies to assisting nature and climate when once the invalid is in our midst?

"It is an absurd supposition that any climate exerts a specific influence in arresting phthisis," writes Dr. Flint, in his article in "Pepper's System of Medicine." Whether this statement be true or not, we know, by proof positive, that Colorado climate, assisted by wise direction, and cautious living, has been curative in cases without number that would probably have proved fatal under their old surroundings and conditions, and we can but argue from this, that what has been done can be done again, and that like conditions and like causes will produce like results in the future as they have in the past.¹

—The Board of Health of Syracuse, N. Y., has condemned the High School building, on account of defective plumbing. It was built in 1869, at the cost of \$100,000.

¹ Exception was taken in the discussion, to the remark that "most of us will probably agree in the assertion that this rare, elevated air is contra-indicated in the so-called third stage of phthisis, and it was claimed that the amount of lung-tissue involved was more of a contra-indication than the stage of the disease. There is truth in it may be in this view; and what is perhaps intended by those maintaining these views is, that Colorado is not the place for "forlorn hopes."

A REDUCING SUBSTANCE IN HUMAN URINE RESEMBLING GLUCOSE.¹

BY T. BARTON BRUNE, M.D., OF BALTIMORE, MD.

AFTER completing the analysis already reported to this honorable body, I resumed the investigation of the urine on the 20th of last month, at the Johns Hopkins University Chemical Laboratory, and I take this opportunity of expressing my indebtedness to Professor Remsen for his kindness in offering me the facilities of the laboratory, and to Dr. C. Piggott, of the chemical department, for very efficient assistance courteously rendered.

As the behavior of this substance so closely resembled that of the compound reported by Dr. Walter Smith,² and believed by him to be proto-catechuic acid, the first step was to apply his method to the urine in question.

For that purpose, about 240 cc. of the urine were treated with an excess of a solution of neutral lead acetate and filtered. The filtrate gave the same brown and green reactions, with sodic hydrate and ferric chloride, respectively, that the urine did. It was then treated with an excess of a solution of basic lead acetate (Goulard's extract), and again filtered. This second filtrate did not respond to sodic hydrate and ferric chloride. The basic-lead acetate precipitate was then washed, suspended in water, and a stream of sulphuretted hydrogen passed through the mixture. The resulting black mixture was again filtered, and the clear, colorless filtrate responded to sodic hydrate and ferric chloride, as had the original urine.

This filtrate was then distilled in an atmosphere of carbon dioxide, and the distillate tested as before for the brown and green reactions, which were not obtained. The dark-brown, crystalline residue, however, dissolved in water, distinctly responded to sodic hydrate and ferric chloride, as had the urine, and, consequently, according to Dr. Smith, should have been proto-catechuic acid.

The quantity thus obtained was very small — too much so for an elementary analysis — so we determined to compare its solution with a dilute solution of pure proto-catechuic acid. On doing so, a marked difference was at once apparent. Our product in very dilute solution gave, with sodic hydrate, a faint reddish-brown color, rapidly becoming a deep brown on agitation in the air (that is, by oxidation), while proto-catechuic acid gave a very faint brownish color, only slightly deepened on agitation. With ferric chloride, our substance gave a distinct, but transient bluish-green, the liquid then becoming turbid, and of a dirty, greenish-white color. Upon the addition of sodic hydrate, the mixture becomes at first a bright bluish-green, then red, and on agitation, a brownish-red. Indeed, the readiness with which this substance took on a brown color in the presence of an alkaline solution (sodic and potassic hydrates and carbonates) was one of its most striking peculiarities. In the reaction with ferric chloride and sodic hydrate combined, the ferric chloride had to be added in very small quantity, lest on the addition of the sodic hydrate, ferric hydrate should be precipitated in quantity sufficient to obscure the result.

Proto-catechuic acid gave a bright, distinct, permanent bluish-green with ferric chloride, turned to a bright,

¹ Read before the Baltimore Academy of Medicine, January 18th, 1887, Continued from page 622, Vol. CXV.

² Dublin Journal of Medical Science, Vol. xxiii., p. 465, et. seq.