

as these have shared in the formation of basis substance in the process of normal development.

4. The medullary or indifferent corpuscles will still represent a tissue so long as they remain interconnected and continuous. By a simple reappearance of basis substance the most favorable termination is established, so-called "resolution."

5. If the inflammatory or medullary corpuscles have largely augmented, a number thereby remaining in original connection, the result will be productive, viz.: with a newly formed tissue of increased size, a so-called "hyperplasia."

6. If the inflammatory corpuscles springing from previous "cells," basis substance and blood-vessels break asunder and become isolated, they will be suspended in an albuminous liquid, they will henceforth represent pus corpuscles.

7. Pus, therefore, is a destroyed tissue broken up into its constituent elements, and as such unfit for production of a new tissue, although the single pus corpuscle will remain alive and amœboid almost indefinitely as long as they are sufficiently nourished.

8. The emigration of colorless blood corpuscles certainly participates in the formation of pus and in the purulent discharge of proud flesh or granulation tissue, and is probably the main source of the pus.

9. Suppuration is caused by the presence of certain microbes, mainly the three varieties of staphylococcus, only when a previous inflammation be present in the tissue, furnishing a favorable soil for the development of the before mentioned microbes.

10. Staphylococcus is not the only antecedent of suppuration, it having been proved by experiments that the introduction of certain chemical agents, unfavorable to the development of microbes, may likewise be followed by suppuration.

THE CLIMATE OF SOUTHERN ALBERTA AND ITS RELATION TO HEALTH AND DISEASE.

Abstract of a Paper read at the Annual Meeting of the Canada Medical Association, Banff, Alberta, August 16, 1889.

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It appears to me that no apology is necessary in introducing the subject of this paper. It is only a few years since the opening of our great National highway brought the Northwest Territories into touch with the rest of the world; and only a few years further back since these vast plains and mountains, which are now so quickly becoming the homes of civilized man, were regarded as an inhospitable desert, fit only for the buffaloes which roamed their solitudes and the Indians subsisting on the chase. The past five years have been epoch-making so far as our great

West is concerned. Coincident with, and following on the building of the Canadian Pacific Railway, a flood of light began to illumine the Eastern intelligence, and as a consequence settlement has steadily and in a gradually increasing stream poured into the Territories.

It will be readily understood that a country almost equal in area to Russia must have many diversities of climate. As I cannot undertake to speak for the whole of the Northwest, I have limited my remarks to that part with which I am best acquainted, viz.: that strip of country lying along the eastern base of the mountains, and more particularly the southern part of this—bounded, say, on the north by the C. P. Ry. I make the eastern limit a line drawn north and south through Letheridge, although for all practical purposes this line can be extended as far east as Medicine Hat. On the south is the International boundary line, and to the west the summit line of the Rockies and British Columbia. This Southern Alberta comprises an area of 150 miles square, of mountains, foothills and prairie. It is intersected every few miles by mountain streams as yet unpolluted by the filth and garbage of more thickly settled communities. Its general character is treeless save along the valleys of these streams, which are fringed by the willow and cottonwood, and on the sides and bases of the mountains. To the outside world this is known as Canada's grazing country, whence England will draw a large part of its future beef supply. As a sort of corollary to this, it has also been known in a general way that it was reputed to have a milder climate than the rest of the Northwest Territories. To most of you the following description will be not only interesting but necessary to a proper understanding of what follows. It is taken from an admirable paper by Mr. C. C. McCaul, of Letheridge, published in the August number of the *American Meteorological Review*. After noticing that winter only really sets in about the middle of December, he goes on to say:

It is characterized by a maximum of bright, still, cloudless days, a scanty snow fall, and frequent and prolonged breaks of warm weather, heralded by the Chinook wind, of which more hereafter. Occasionally a bad snow storm will cover the prairie and hill to a depth of 18 or 20 inches. This, however, is very exceptional. The winter generally breaks up in February by a grand blow from the west, followed by a period of from one to three weeks of warm, bright weather, which may fairly be called the beginning of spring. Spring, here as elsewhere, is the most variable and capricious season of the year. On the whole it may, perhaps, be described as cold and damp, with frequent rainfalls, varied by bursts of the most gloriously bright warm weather, lasting sometimes a fortnight or three weeks.

May is generally fine, warm and bright; June

and the earlier part of July rainy; the remainder of July, August, September, October, and generally November, warm and very dry. The summer, July to September, is characterized by hot days and cool nights, with very little rain, but the warm, lazy days of autumn, often lasting well into December, are the glory of the year.

The grand characteristic of the climate as a whole, that on which the *weather* hinges, is the Chinook wind. It blows from west to southwest, in varying degrees of strength, from the gentle breeze that just tosses the heads of the daisies and sunflowers, to the howling gale that carries off contributions of chimneys, barrels, shingles, hats, and miscellaneous rubbish to our neighbors in Assinaboia. In winter, the wind is distinctly warm; in summer not so distinctly cool. Its approach is heralded by the massing of dark cumulus clouds about the mountain tops, and a distant wailing and rumbling from the passes and gorges. Its effect in winter is little short of miraculous. When a *real* Chinook blows, the thermometer often rises in a few hours from 20° below to 40° above zero; the snow, which in the morning may have been a foot deep, disappears before night; everything is dripping; but before another night falls all the water is lapped up by the thirsty wind, and the prairie is so dry that a horse's hoofs hardly make an impression upon it as you take your first welcome canter, after a prolonged and tedious spell of "settin' round the stove."

It may be added to this that the elevation above sea level of the plains here varies from 2,700 feet at Letheridge to 4,500 feet at the entrance of the Crow's Nest Pass, which may be taken as the base of the mountains proper.

The winter and early spring are characterized by the coughs and colds incident to these seasons in almost any country. Summer is very healthy, and in autumn there are occasional cases of malarial fever of a remittent type, of which more hereafter.

Rheumatism is remarkably rare when one considers the sudden changes of temperature that often occur and the fact that most of the male population have led lives of the greatest exposure. When it *does* occur, it is almost always in the subacute or chronic form. Affections of the lungs are also very infrequent.

Summer disorders are almost unknown, a fact which must be attributed partly to the sparseness of population, but which is largely due, in my opinion, to the cool nights. About nervous affections I am hardly in a position to speak, but I judge that the rarefied air and the sometimes high winds would not be beneficial. During the past four years I have had three cases of paralysis—hemiplegia, occurring in patients otherwise perfectly healthy, cowboys in the prime and vigor of manhood, who have had no specific disease and were quite temperate, and whose family history

the most careful inquiry found irreproachable. These cases were and are a puzzle to me, and I can imagine no cause but excessive riding.

I have alluded to the existence of an endemic malarial fever occurring principally in the fall. This is general throughout the territories, and has given rise to much comment and some difference of opinion among medical men. Its character is variously modified by the season, climate, soil and immediate surroundings of the locality in which it is present. It has been called remittent, intermittent, malarial, typho-malarial, and typhoid according as a certain set of symptoms predominated, and is known throughout all the West by laymen as "mountain fever." I have seen this fever at its highest, characterized by a chill and symptoms of a heavy cold, and broken up at once by free diaphoresis and a dose of quinine. On the other hand, I have attended cases in which all treatment was of no avail, cases badly affected by environment, that would go on from bad to worse until they would sink into the typhoid state—too often only the beginning of the end. Between these extremes all grades of severity are met with—their most general characteristic being, however, their atypical character. Routine treatment is therefore impossible except, perhaps, at the beginning, when I make it a rule to relieve the bowels by a calomel purge, promote free diaphoresis by pulv. ipecac. co. or antipyrin, sometimes a combination of the two, and give two or three large doses of quinine. Subsequent treatment on general principles.

I have alluded to the different names by which this fever has been called and the consequent confusion. The cause of this is the tendency to regard it as a distinct typical disease, *which it is not*. The cause may be the same (no one, I believe, has ever questioned its malarial nature); but the variations in the course, symptoms and severity are important enough to entitle them to be called almost distinct types. These variations are due to locality, to the season, to different conditions of soil, climate, atmospheric moisture, etc., and to the individual. Another cause of the confusion has been the occasional occurrence of typhoid fever and the incautious use of the unfortunate term "typho-malarial." I say unfortunate because I believe that from the time of its coinage in 1861-2, it has never ceased to be a cloak for uncertainty, an unknown quantity in statistics, and an added difficulty to the struggling and inexperienced practitioner. It would be a good thing, in my opinion, if it were expunged from the nomenclature of disease; for, notwithstanding the care that was exercised in its definition by the U. S. Commission, wherein it was distinctly pointed out that it was "not a specific or distinct type of disease, but a term conveniently applied to the compound forms of fever which result from the combined influences of the causes of the malari-

rious fevers and typhoid fever," *there has* been a tendency to elevate it into a distinct type of disease. In the Northwest, while I have often seen severe cases of malarial remittent falling into the typhoid state and cases of typhoid masked at first by malaria; while I confess I have been sometimes at a loss at first to classify my case, I can hardly recall an instance in which waiting a few days did not clear up the diagnosis.

In 1886 I made an attempt to have collected detailed reports of all cases of fever occurring throughout the Northwest, so that the special features of each district might become better known. This attempt was frustrated through ignorance or misapprehension of my motive. It is a matter of regret to me that my suggestions were not adopted, for I am not one of those who believe that we have reached the sum possible of attainable knowledge with regard to malaria. We owe much to the researches of Thomanasi, Crudele and Klebs, Laveran, Osler and Carter, in tracing out the life history in the blood of the malarial plasmodium. But I believe the future has still something to unfold to us of its nature, mode of action outside of, and entrance into the human system. And I believe we have yet much to learn of the relations between the paludal and typhoid poisons. I find it difficult to believe the story of the statistics which tells us that typhoid fever pure and simple is three, four and five times more fatal than the same fever complicated with malaria, and I believe that more care in the diagnosis, which is now rendered somewhat easier by the application of Ehrlich's test; more thoroughness in the recording of cases, and more attention to etiology, will help us to clear up these doubtful points which few will question are stumbling-blocks in our path.

I trust that I have not been misunderstood—that while remarking on this fever at greater length, perhaps, than its importance warrants, I have not led you to the belief that it is a constant menace to life and health in Southern Alberta. I should be sorry to have made this impression, which would be an entirely false one. Some years the country is entirely free from fever; and generally it is mild and readily amenable to treatment. And severe cases will no doubt become rarer when greater care is exercised in personal and domestic sanitation.

I believe I have now said the worst that can be said of the climate of Southern Alberta, and I consider that in doing so I have earned the right to dwell briefly on what appears to me its distinguishing characteristic. I allude to its freedom from diseases of the lungs and its value as a resort or place of living for phthysical patients. I have already spoken of the rarity of pneumonia and other lung affections. I know of two cases of phthisis occurring in the country—one of acute tuberculosis strongly hereditary, and which proved

fatal, and another of fibroid, the cause of which I believe to be the fine dust of the corral acting in the same manner as stone mason's and knife grinder's disease. This latter steadily improved on ceasing work and is now almost well.

On the other hand, I have known of a great many cases of incipient phthisis that have come to Alberta, and in some the disease has been arrested and in others the sufferer restored to perfect health. These facts will not appear strange when the prevailing conditions are considered; for, according to the latest consensus of opinion among climatologists, the climatic treatment of phthisis requires:

1. A dry aseptic atmosphere.
2. A dry soil.
3. The greatest possible number of clear, sunny days during which the invalid can exercise in the open air.
4. A certain amount or degree of elevation above sea level. Equability of temperature within certain limits is not now considered necessary.

I believe I may assert without danger of contradiction that Southern Alberta possesses all these requisites in the most eminent degree. The dryness of the atmosphere is insured by the character of the country, a great grassy, undulating, treeless plain, elevated from 2,000 to 5,000 feet above sea level and distant several hundreds of miles from any considerable body of water. Accurate meteorological data are wanting, but it is sufficient to say that Alberta is not different from that whole strip of country lying at the eastern base of the continental watershed, and which the absence of a sufficient rainfall has caused to be devoted principally to the raising of stock. This dryness of the air, combined with its elevation, almost necessarily renders it aseptic in a wonderful degree.

Elevation is not now considered an essential feature in the climatic treatment of phthisis. The altitude theory, which Miguel did so much to bring into favor and which was so great an advance on the indiscriminate employment of places like Madeira and Havana—places where warmth and equability of temperature and a certain degree of moisture were prevailing features—is now slowly going out of fashion. But it is doubtful if even the immense power of fashion—which, it is to be deplored, is almost as great in medicine as in millinery—will ever be able to seriously affect in the medical mind the value of elevation. The reason it is not so much considered now is that it was found that the curative properties were the dryness and purity of the air, and not necessarily the elevation. But it is difficult, almost impossible, to find a dry aseptic atmosphere¹ without the elevation being near sea level, and for this reason, if for no other, patients in search of a climate will still throng to the elevated regions. Besides, the

¹ Excepting Aiken, Georgia.

other physiological effects of elevation; the increased respiratory activity and expansion of the lungs and chest walls, the consequent increased nutrition, the cool nights, almost compelling sound and refreshing sleep, are features of no little value in the altitude treatment. As before mentioned, the elevation in Southern Alberta varies from 2,000 to 5,000 feet, and the patient can therefore choose the locality which seems to suit best his particular case.

Laennec, Bowditch, Buchanan and others having made it very clear that soil moisture is one of the chief causes of phthisis, a dry soil must be considered a necessity for any place putting forth claims to be regarded as a resort or place of living for consumptives. While I am not able to give the geological formation of Southern Alberta, I can assert without fear of contradiction that its soil must be regarded as preëminently a dry one.

Perhaps a more important point than any of the foregoing—certainly a most necessary one—is the number of days during which patients can take exercise in the open air. Here the want of meteorological observations is again severely felt, but from a private record kept during the five years ending December, 1888, I am able to deduce the following: The number of days which are recorded as overcast, raining and snowing is respectively 51, 49, 56, 53, 44, being an average of a fraction over 50, all the rest being noted as fine. Over 50 per cent. of these (fifty) are simply overcast, so it is fairly presumable that in the large majority of them, confinement to the house would be unnecessary. These observations, moreover, were taken very close to the mountains, where local storms are more prevalent than on the plains.

As to the class of cases for which Southern Alberta is suitable I am content to take Dr. Knight's selection, which is, I believe, approved by the great balance of authority on the subject. It comprises:

1. Those presenting the earliest physical signs of tuberculosis of the apex, who have as yet shown little if any general disturbance from the disease, and who complain only of morning cough and expectoration. As Dr. Knight very truly remarks, the prognosis in this class has been changed from very bad to very good by the improved ideas of treatment.

2. Hæmorrhagic cases without marked febrile reaction or much physical evidence of disease.

3. Certain cases of "fibroid" or "interstitial" pneumonia.

4. Patients recovering from acute pleurisy or pneumonia in whom the irruption of tubercle is dreaded.

For these classes of cases, Southern Alberta offers inducements hardly excelled by any place on the continent. I trust I have already satisfied you that the necessary climatic conditions are present: the dry aseptic atmosphere, the dry soil,

the clear sunshiny days and the necessary elevation. There are one or two other points which I feel compelled to mention. One is that seekers after health are not obliged to remain for a few months only, and then go away again on the approach of winter or summer. Another is that, being a stock-raising country, it is easily possible to spend almost all one's time in the saddle. It was Sydenham who said that "unlimited horseback exercise is almost as good a cure for phthisis as quinine for ague." Another is that Alberta is in Canada, for why should Canadian physicians send their patients to Colorado when they have a climate equally as good within the confines of their own Dominion?

The general conditions of life are those of any new and growing country. Many of the pleasures of the East have to be dispensed with, but to most people, the bright sunny skies, the pure, bracing, intoxicating air, the exhilarating freedom of outdoor life and the unrivaled scenery of Alberta, will amply compensate for the artificial pleasures they are obliged to forego.

MEDICAL PROGRESS.

JABORANDI AS A PARTURIFACIENT.—Under this caption DR. N. P. MOSS reports a few cases (*N. O. Med. and Surg. Journ.*) in which jaborandi seemed to expedite labor, and his explanation of the *modus operandi* of the drug is unsatisfactory, as he seems to attribute it merely to its diaphoretic properties. His cases are also not numerous enough to serve as a basis for accurate deductions. Pilocarpin has been proven beyond doubt to possess a powerful action upon the uterus, and it has been employed to a considerable extent as an abortifacient. Professor Schauta, of Prague, has employed pilocarpin in more than forty cases as a means of strengthening labor pains. Injected subcutaneously he has found it active in 2 per cent. solution, although he has also used it in 3 or 4 per cent. solutions. Schauta went so far as to measure the effects of his doses by means of the manometer, and reached the conclusion that the influence of pilocarpin upon the uterus is a very powerful one, although it varies greatly according to individual susceptibility. In 1881 Van der Mey made experiments upon pregnant rabbits from which he obtained similar results. Gigollet has reported the case of a woman in whom premature labor was twice induced by the administration of pilocarpin, three injections at intervals of four hours having proved sufficient. Prof. Schauta gives the following rules for the administration of pilocarpin: After careful examination of the organs of respiration and circulation I would administer on the first day, if necessary,