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OBSERVATIONS UPON PULMONARY TUBERCULOSIS IN COLORADO

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OBSERVATIONS UPON PULMONARY TUBERCULOSIS IN COLORADO.[1]

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THE object of this paper is to institute an inquiry, from a clinical standpoint, as to the relation of the Colorado climate to the course of pulmonary tuberculosis.

For its proper consideration a large experience is essential, to be secured only from a prolonged residence in the State in constant intimate association with the disease, with ample facilities for extended investigation.

Although appreciative of the exhaustive nature of the subject, and mindful as well of my own limitations, I venture to offer the results of my experience, together with brief statistical data, in the hope that therefrom may be derived some approximately accurate and practical conclusions. It is not my intention to enter into an elaborate analysis, as I am somewhat sceptical as to its practical utility.

My opportunities for observation have been extended through a residence of five and a half years in Colorado. I present, however, a series of 200 cases seen in private practice during a period of two years. These cases have been carefully selected, subjected to continued personal supervision, and conscientiously recorded.

[1] Read at the Fourteenth Annual Meeting of the American Climatological Association, Washington, D. C., May 5, 1897.

In order to obtain great accuracy of conclusions, an effort has been made to include only those in the list whose condition upon arrival seemed to be especially applicable to the climate, and who have subsequently remained under constant observation.

No case is presented that has been observed for less than six months, nearly all, however, having been seen during a much longer period.

The diagnosis was confirmed by examination of the sputum in all cases where the physical signs did not furnish indubitable evidence of the nature of the affection. In fact, this was adopted as a routine measure in the majority of instances.

Considerable difficulty was experienced in the proper classification of the cases. Usually quite extensive infection had taken place before the arrival of the patient in Colorado. The very incipient stages were therefore but exceptionally observed, while far advanced cases with practically hopeless prognosis were not admitted in the list.

It may be fairly assumed, therefore, that the 200 cases form a rather distinctive class, embracing in a general way those with pronounced tubercular infection which would have pursued an unfavorable course at home, but offered reasonable assurance of improvement in Colorado.

Further classification, made solely with reference to the stage of the disease or the extent of the process, would be, I believe, very misleading. I have preferred to make the division according to the individual prognosis at the time of arrival, the estimate of which was based upon a careful review of all the factors having a possible bearing upon the case, without exclusive reference to the area or degree of pulmonary involvement.

There are three classes, based upon relative prognosis :

Class A. Prognosis excellent. Moderate infiltration, limited to one lobe or a portion of the same; evidences of moisture; no softening; pulse, appetite and digestion good; temperament sensible. Other considerations favorable.

Class B. Prognosis fairly good. More extensive involvement of one lung, or portions of both, namely: consolidation of one lobe with moist râles, or with possible beginning cavity formation; partial consolidation of entire lung, with evidences of moisture; infection of both lungs, with signs of consolidation limited to apices or thereabouts.

Finally, cases that, from consideration of physical signs alone, would belong to "Class A," but, owing to nervous, circulatory or digestive disturbances, or other unfavorable circumstances, would properly come under "Class B."

Class C. Prognosis doubtful. Extensive active infection limited to one lung, with or without small or moderate-sized cavities. Definite invasion of both lungs, with but moderate activity of the process. Cases with somewhat less pronounced pulmonary involvement, but with considerable constitutional impairment, or associated with other obviously unfavorable factors.

I am too well aware of the deficiencies of this method of classification, but have been able to adopt none other affording upon the whole equal satisfaction.

In describing the results obtained, I make no mention of any cases as cured.

By apparent total arrestment, I allude to entire absence of moisture, or of other evidences of activity of the tubercular process, complete cessation of cough or expectoration, and no apparent constitutional disturbance.

By marked improvement, I refer to an excellent general condition, frequently sufficient to justify the performance of work, but the persistence of signs of slight existing trouble, with or without morning cough or expectoration.

By improvement, I refer to a material lessening of the activity of the process as disclosed by physical signs, diminution of cough and expectoration, lowering of pulse and temperature, increase of appetite, digestion and weight.

Of the 200 cases under consideration, 40 are included in Class A, as follows:

Apparent total arrestment	21
Marked improvement	7
Improvement	8
No change	2
Dead	2

Thirty-six out of 40, or 90 per cent., have received material benefit.

Class B numbers 54:

Apparent total arrestment	10
Marked improvement	21
Improvement	12
No change	5
Grown worse, or dead	6

Forty-three, or over 79 per cent., have gained in this class.

Under Class C, with a total of 106, the results are:

Apparent total arrestment	2
Marked improvement	29
Improvement	28
No change	15
Distinctly worse, or dead	32

Over 55 per cent. have improved, a large propor-

tion in view of the character of the cases considered in this class.

The results obtained for the entire number, without distinct reference to class, are:

Apparent total arrestment	33
Marked improvement	57
Improvement	48
No change	22
Grown worse, or dead	40

Sixty-nine per cent. of the cases have improved in Colorado; 45 per cent. have made very decided improvement; 16½ per cent. have obtained complete arrestment of the tubercular process.

The significance of these figures is emphasized by the comparatively short period of observation.

It is manifestly fair to assume that a fair proportion of those classed as *much improved* will, in the course of a more prolonged period of observation, obtain ultimate complete arrestment.

In like manner, it may be expected that several exhibiting moderate improvement now may subsequently be placed in the column of *decided improvement.*

There appears, however, from my own experience, but little probability, save in exceptional instances, of any very distinctive change for the better taking place in those who had failed to show improvement during one year in Colorado, if under competent medical supervision.

In justice to the climate, an important modification of these results should be explained by the effects of intercurrent disease, accident and pronounced individual indiscretion.

Among the 62 cases reported as not having responded favorably to the climatic influences, 11 had

previously done well, but in whom subsequent failure may be ascribed as follows:

Appendicitis; operation, death	1
Empyema; operation, death or grown worse	2
Suicide	2
General tubercular invasion	1
Palpable imprudence	5

Should these facts be admitted in the analysis of results, it would appear from the entire data introduced that about three-fourths of all the cases properly applicable to the climate may be expected to improve.

It is interesting to note that my report of general results is much in accord with that of Dr. Fisk in his elaborate analysis in 1889 of 100 recorded cases in Colorado.

My further observations are summarized briefly as follows:

AGE.

Periods.	Cases.	Improved.	
17 to 20	12	8, or 66%	
20 to 30	102	75	73
30 to 40	67	41	61
40 to 50	14	10	71
Over 50	5	4	80

From these figures, the influence of age within certain limits upon the course of the disease in Colorado would seem but slight, although somewhat in opposition to the generally accepted opinions. The similarity of results at the several periods of life referred to is somewhat surprising, but is nevertheless offered for what it is worth as perhaps one of the anomalies of my experience.

SEX.

Males, 145. Improved	100, or 69%
Females, 55. Improved	38, or 69%
Married Females, 21. Improved	12, or 57%
Unmarried Females, 34. Improved	26, or 76%

It was noticed that a very large proportion of the males came to Colorado alone. Of the females, those who were married were almost invariably accompanied by husband or children. The unmarried females were found, with two or three exceptions, to be under thirty years of age. The practical points to be recognized from reference to the above are —

(1) Nothwithstanding the fact that the disease has been universally found to attain greater prevalence among the members of the female sex, yet opportunity for a possible arrestment by a change of climate is not offered to the female nearly as frequently as to the male.

(2) That the percentage of improvement in females is materially greater in those who are unmarried and without family encumbrances.

(3) That, despite obvious adverse conditions and contrary to established conclusions, the female in this series of cases has responded to the favorable influences of the climate equally with the male.

Lest this be regarded purely as an instance of the strange fallacies of statistics, I offer several possible explanations in support of my results.

In Colorado, the question of success or failure in the effort to secure arrestment depends largely upon the ability of the individual to conform to a proper regimen of daily life, entailing for its greater perfection certain physical and mental requirements. These, I believe, are possessed to a greater extent by the female.

I cannot see that the separation from family is essentially harder for her to bear than for the male. On the contrary, she seems to adapt herself to strange conditions quite as quickly and as comfortably. While, in general, less opportunity is offered for an existence in the open air with judicious exercise, a life of more

complete rest is assured, with perhaps as many hours of sunshine. There is less chafing under restraint, less of the cares and responsibilities of life, less tendency to acts of imprudence, and, from my experience, more implicit obedience to detailed instructions.

It is but fair to add that the financial circumstances of the female invalid in Colorado are in general relatively superior to those of the male. It is no uncommon occurrence to meet the young man with extensive tubercular infection and insufficient means, who has been sent to Colorado (and usually to Denver) with instructions to secure immediate employment by which to supply his necessities. In the event of either success or failure in his effort to find work, the battle is for him against great odds. As a general rule, cases with such limited resources are better at home.

The female invalid does not usually seek change of climate unless proper provision has been made for her support.

RACE. DISTRIBUTION. PREVIOUS ENVIRONMENT.

Fifty-three, or rather more than one-fourth of the cases occurred in those of direct foreign descent, although many were born in this country, and in most instances from the better class. It does not seem profitable to enumerate statistics relative to the several nationalities.

The 53 cases are distributed somewhat equally among the Jews, Irish, Germans, Scotch, Swedes, English and Canadians.

The Jews, numbering eight, have almost uniformly shown more extensive pulmonary involvement upon arrival, but have exhibited apparently greater resisting power than any other race. I have been impressed with the disproportion in these people between the

physical signs and the general condition. While the course of the disease has been usually prolonged, the process of arrestment, on the other hand, has been slow and disappointing. The Jew has been invariably obedient and conscientious to the last degree in following instructions.

The Irish, from my experience, have seemed to be more especially predisposed than others. The disease has been more rapid, the process more active, with greater tendency to nervous disturbances, and the patient harder to control.

The Swedes, although apparently hardy and vigorous, have succumbed much more quickly than those of our own country. They are usually exceedingly apprehensive, and easily managed.

It has been my general experience that the Germans, Scotch, English and Canadian adapt themselves quite readily to an appropriate system of living, excelling in this respect our more restless Americans.

The latter number 147 in my series of cases, and are principally from New England and the extreme Eastern States. The list includes 30 from the Middle States, 10 from the South, and strangely, none from the region west of the Rocky Mountains.

I think it may be said that certain tendencies incident to previous surroundings and environment are, like racial characteristics, not without some influence in modifying the course of the disease. The lighter the burden of business responsibilities, the more phlegmatic or philosophical the individual, with less of general restlessness or irritability of temperament, the better the prognosis.

Too frequently the patient comes to Colorado for a prescribed number of months. His recovery must take place in that period, as no further extension of time can be diverted from his business, which he often

continues to direct by correspondence, and meanwhile indulges occasionally in speculative investments in Colorado.

The previous occupation appears also to possess some significance. From my experience, those who have previously led sedentary lives are likely to do better upon coming to Colorado, under a system of rational management, than those who have been accustomed to outdoor occupations, the obvious explanation being the opportunity permitted for greater change in the mode of life, and consequent greater impression upon the course of the disease.

INHERITED PREDISPOSITION.

Seventy-seven of my cases present a history of previous family taint. Without entering upon an unnecessary analysis, it is of some interest to state that in nearly one-half the cases, brothers and sisters were alone affected.

In noting final results, there are singularly no distinctive differences relative to the source of the inheritance. The percentage of improvement for the entire number is 60, as compared with 72 per cent. for those with no apparent inherited susceptibility. May not the similarity of results possess some significance in the proper estimate of the influence of predisposing causes other than those of inheritance?

The frequent existence of definite predisposing causes among several members of the same generation in one family, without history of immediate inheritance, is to my mind strong supplementary evidence in support of the view that the relation of heredity to the etiology of the disease consists, as a rule, not in the direct transmission of the bacillus but in the increased vulnerability of pulmonary tissue, with diminished resisting power of the individual.

The occasional occurrence of congenital tuberculosis is demonstrated by the detection of the bacilli in the placenta or in the organs of the newly born, as well as by the positive results in exceptional instances, attending inoculation in guinea-pigs from the placenta, or the organs of the child, despite the failure to discover either the bacilli or the evidences of tuberculosis in the tissues.

Inasmuch, however, as negative results have frequently followed similar investigations, even where active tuberculosis existed in the mother, it is safe to say that no conclusive testimony has yet been adduced to substantiate any frequency of intra-uterine infection.

EXTENT AND CHARACTER OF PULMONARY INFECTION.

At the time the cases came under my observation, the tubercular process was limited to the right lung in 59 cases, to the left in 31, and with involvement of both in 110.

The fact that more than one-half of those in my entire list came to Colorado with pronounced signs in each lung should emphasize, I think, the necessity for earlier diagnosis and more prompt climatic treatment.

It is somewhat remarkable that the percentage of improvement for those with double infection is nearly equal to that of those with single lung invasion.

Well-defined cavities have been recognized in 23 cases, in 13 of whom the improvement has been very perceptible.

The significance of these facts must be to the effect that the prognosis is dependent not alone upon the area of involvement, nor the degree of tissue destruction, but as well upon the present activity of the process, and upon the influence of other factors of recognized importance.

I desire to make mention of the frequency with which I have found localized areas of active infection in the mid-scapular space, with no signs elsewhere in the same lung.

I feel that this region, the importance of which is perhaps hardly appreciated, is occasionally the seat of the only active trouble existing within the chest, the same not infrequently escaping recognition. I am also led to believe that signs of incipient infection in the axilla of the apparently non-affected side are occasionally overlooked.

In the extension of the tubercular process from the right lung to the left, I have several times observed the locality first infected to be the tongue-like projection of lung covering the apex of the heart, the signs extending slightly to the left before evidence could be detected of involvement elsewhere.

MODE OF ONSET.

Thirty-eight cases were said to have been shortly preceded by *la grippe*. The history usually given was that of an acute attack of but few days' duration, attended with cough, which persisted or subsequently returned. In round numbers, 60 per cent. of these have improved in Colorado.

Thirty-two cases were associated with hemorrhage in the very early stages, this being the first intimation of existing trouble. Over 84 per cent. have made improvement.

Seventy-six cases conform to the anemic type; percentage of improvement, 59. Seventeen began with symptoms of cold, 82 per cent. showing an improvement.

The remaining cases either followed pleurisy, with or without effusion, pneumonia, typhoid fever, measles,

or whooping cough, statistical observations concerning which are hardly profitable.

Special attention is called to the prevalence of *la grippe* as a causal factor, with its relatively unfavorable results, the high mortality-rate attached to cases of insidious anemic origin, and the remarkable percentage of improvement obtained in initial hemorrhagic cases. The probable explanation of the latter is found in the opportunity offered for more early diagnosis, and more prompt removal to Colorado.

RELATION OF CLIMATE TO CASES WITH HEMORRHAGE.

Seventy-eight of my cases presented the history of one or more hemorrhages before arrival. Of these 13, or about 16 per cent., had recurrences subsequently. Seven were distinctly of aneurismal origin, occurring after long periods of relief, and induced by obvious acts of over-exertion, or other indiscretions.

Of the remaining 122, eight have experienced their first hemorrhage since coming to Colorado.

With reference to the general condition, the percentage of improvement for the entire number of hemorrhagic cases is 79; for the non-hemorrhagic cases, 62 per cent.; for those with previous hemorrhage, but no recurrences in Colorado, 87 per cent.; for those with subsequent recurrences, 38 per cent.; for those with initial hemorrhage occurring after arrival, 37 per cent.

A comparison of these results would indicate broadly that hemorrhagic cases do remarkably well in Colorado, even better than the non-hemorrhagic; that the proportion of recurrences is small, that cases with recurrent hemorrhages after arrival are less favorable, and that hemorrhages *beginning* in Colorado are attended with still more serious results.

In general, I am impressed with the restraining influence of the climate upon the tendency to repeated hemorrhages in those cases of more remote origin, but question the effect of the altitude upon those of very recent date, the very means of subsequent protection becoming at first a source of increasing danger.

Hemorrhages beginning in Colorado are apt to be severe, being in very many instances of the aneurismal type.

I am not prepared to venture any clinical opinion as to the general severity or degree of shock attending hemorrhages occurring in Colorado, as compared with the same at lower elevation, on account of insufficient opportunities for observation at the sea-level. My patients, however, from their own experience, have seldom been able to perceive any marked differences in this respect.

Since the compilation of these results some two or three months ago, I have been forced to recognize the existence of a considerable number of exceedingly small hemorrhages without disastrous results among patients apparently doing well, the most of whom, however, are not included in this list.

In view of the uniformly benign character, their origin is presumably incident to slight disturbances of circulation consequent to retrogressive interstitial contraction, and hence a possible indication of the favorable progress of the disease.

FUNCTIONAL NERVOUS DISTURBANCES.

It is frequently urged that residence in high altitudes for the consumptive is contraindicated by the coexistance of certain nervous phenomena, as severe and protracted headaches, insomnia, irritability and other manifestations of hysteria. The reason adduced is the supposed aggravation of the nervous symptoms, and

the consequent unfavorable influence upon the course of the tubercular disease.

The inference implied is that improvement in the nervous derangement must precede any change for the better in the lungs.

These conclusions, however, are not borne out by the established facts in experience.

The observations for many years in Denver of the neurologists, Drs. Eskridge and Pershing, indicate no influence of altitude whatever upon functional nervous disorders. With this, my own experience relating to the nervous disturbances in the pulmonary invalid is in complete accord.

Fourteen of my patients included in this paper exhibited nervous symptoms to such an extent as to seriously prejudice the chances of recovery. No history could be obtained of any aggravation of the same upon coming to Colorado.

Nine have obtained partial arrestment of the process and material improvement in the general nervous condition. Two have shown no abatement of physical signs, but have made a distinct gain from the standpoint of the neurologist.

I am convinced that such results could not have been secured in the warm moist climate with low elevation, so frequently recommended for this class of patients.

I recognize that the existence of pronounced nervous manifestations offers a serious obstacle to improvement in any climate, but regard the pulmonary infection as the paramount issue, and insist upon the functional derangement as demanding greater attention to details of management, rather than change of climate.

I have frequently observed improvement in neurotic, as well as other cases, following change of surround-

ings, without the slightest difference in climatic conditions, as even from one section of Denver to another.

The psychical influence of the change appears to be the essence of the benefit produced. It has invariably been the case that improvement in the nervous symptoms has been in proportion to the degree of arrestment and the gain in the general strength.

BRONCHIAL IRRITATION.

It must be admitted that this annoying condition exhibits a tendency to persist for a period, or to become temporarily aggravated in Colorado. I am convinced, however, that in but exceptional cases does there exist any relation to the prognosis. The possible irritative effect of the altitude and dryness upon the bronchial mucous membrane, disagreeable though it may be, is by no means a criterion of the precise influence of the climate. The efficiency of the latter is measured solely with reference to the subsequent course of the tubercular process, which is the only consideration of especial importance.

The bronchial irritation presented in these cases is of minor significance, and may be assumed to be rather an expression of individual idiosyncracies, susceptible in nearly all instances of decided amelioration under a proper régime.

Twenty-three of my cases suffered to a greater or less extent from a frequent dry useless cough, often of a paroxysmal nature, and subject to exacerbations, without apparent cause. In all these, the irritative bronchial character was sufficiently defined to permit distinct classification.

Thirteen have made decided progress toward arrestment of pulmonary disease, with a correspondingly marked diminution of the bronchial irritation.

Five are about the same with respect to the active

process, but with bronchial irritation much diminished.

One is doing poorly, with bronchial irritation less.

One is doing poorly, bronchial irritation not diminished.

One is about the same, but with bronchial irritation unchanged.

Two are dead.

The results obtained are certainly satisfactory, and if possessed of any value from which to draw provisional conclusions, would suggest that the presence even of a considerable degree of bronchial irritation is to the pulmonary invalid no contraindication for the Colorado climate.

Only in cases where this condition is associated with, or dependent upon extensive pathological changes, involving the pulmonary or circulatory apparatus, of themselves demanding a different climate, would I consider such a course advisable.

I will add in this connection that I have not regarded the existence of simple valvular heart lesions as necessarily contradictory to high altitudes for the consumptive. Aside from gross degenerative changes or dilatation, I believe that the question of residence for the consumptive, with cardiac complication, must be settled solely with reference to the relation estimated to exist between the demands for work upon the heart, and its power to respond to the same.

FEVER.

There is perhaps no single feature in the final estimate of the prognosis of greater importance than the temperature, as denoting the degree of activity of the process, and the measure of individual resistance.

Cases presenting the fever of septic absorption are not included in this list, the most of my cases conform-

ing to the intermittent type of tuberculization or ulceration.

Sixty-eight upon arrival exhibited daily in the afternoon a temperature of 100.5° or over; 55 per cent. of these have gained very perceptibly.

From my general observation I do not incline to the opinion that fever is increased in Colorado, or that pyrexia in itself (other conditions permitting) is a contraindication for high altitudes.

COMPLICATIONS.

Among the various complications, simple mention is made, without reference to statistics, of the occasional development of empyema, pneumothorax, fistula, syphilis, sarcoma, purpura hemorrhagica, acute rheumatism, typhoid fever, and tubercular involvement of brain, glands, intestines, bones and epididymis.

In six cases, the tubercular process developed in patients who had been subject for some years to genuine asthma. These have all done well in Colorado. I do not refer, of course, to the dyspnea of symptomatic asthma, dependent upon pronounced pathological changes.

There is one complication, however, of especial interest, and worthy of more extended notice — tubercular laryngitis.

Twenty-one of my patients have suffered from this condition. Six have shown general and local improvement. Ten have grown worse. Five have died.

In ten the disease existed before arrival. Four of these have done well. Six have died or grown worse.

In eleven the laryngeal involvement developed in Colorado. Of this number, however, seven presented no evidence of the disease until a few weeks before death from pulmonary involvement, and are therefore without especial significance.

Of the remaining four, who may be fairly said to have developed the disease in Colorado, two have improved in every way.

These results do not suggest any deleterious effects of the climate with reference to the development or the course of laryngeal tuberculosis. In fact, with local treatment, improvement in this respect is largely commensurate with the gain in the general condition.

The existence of tubercular laryngeal involvement, and especially if not confined to the interior of the larynx, is a serious complication in any climate.

MANAGEMENT.

Without enumeration of details, I may state that none but the more rational and conservative measures of treatment have been employed. In no instance has use been made of tuberculin, anti-phthisin or nuclein injections, inhalations of any kind, the various forms of breathing appliances, or other special methods of treatment with their modifications.

The general essentials recognized have been an inactive life in the open air during as many hours as possible in the daytime; the maximum amount of proper nourishment, contentment of mind, attention to digestive and other disturbances, as they arise; strict regard to the minor details of daily life, with occasional admonitions, frequent reassurances, but constant vigilance.

The patients have been uniformly instructed, as far as practicable, concerning the true significance of their condition, in the hope of appealing directly to their own intelligence, and securing their more active cooperation.

An effort has been made to recommend, from personal knowledge, suitable accommodations providing proper conditions for the individual case.

I have preferred a residence in the higher and more thinly settled portions of the city or neighboring ranches, and during the summer-time, removal to the mountains. The latter is usually of decided benefit.

A large proportion of the reported cases spent the summer of 1896 at the same mountain resort, thus admitting closer medical supervision than if widely scattered, and with altogether more satisfactory results.

Strychnine has been of chief importance in my medicinal therapeutics, together with nutrients, creosote to a moderate extent, and rational measures looking to the relief of cough, as well as digestive, circulatory and nervous disturbances.

No matter how complete the arrestment, I have never approved of a permanent return to the previous conditions of climate or general surroundings.

The increased expansion with vesicle dilatation resulting from a somewhat extended residence in elevated regions, is no argument against the selection of Colorado as a health resort, but does constitute one of the strongest objections against a subsequent return.

I will submit for your acceptance my conclusions, namely:

That climate offers to the pulmonary invalid greater assurance of improvement than can be otherwise obtained.

That the meteorological conditions along the Eastern Rocky Mountain slope are especially applicable for this purpose.

That throughout this region, portions of Colorado surpass other localities by virtue of her immensely superior accommodations, her increased social advantages, and, later on, her favorable business opportunities.

That a greater number may be expected to acquire

ultimate permanent arrestment, or at least secure material improvement, in this State than elsewhere.

That residence in Colorado, at an elevation of from 5,000 to 7,000 feet, is indicated for the large majority of cases without especial reference to age, sex, race or family predisposition.

That functional nervous derangements, bronchial irritation, pyrexia, moderate-sized cavities, tubercular laryngitis, and valvular cardiac lesions are not of themselves contraindications to the high altitude.

That hemorrhagic cases, within limits previously mentioned, are peculiarly appropriate for the Colorado climate.

Broadly speaking, that the only cases unsuited for residence in this State are those with very extensive infection, considerable destruction of pulmonary tissue, enfeebled cardiac power, well-marked sepsis or exhausted finances.

That the benefit derived is dependent, not upon climate alone, but as well upon the conscientious attention to mode of life and management.

That for the successful management, conservative rational measures are essential to the exclusion of the special methods.

Finally, that cases should come early and come to stay.