cial food digester, instead of seeking out the causes of the disorder and endeavoring to remove the same. The natural digestive fluids are the products of vital activity in living structures. The salivary glands, the gastric tubules, the pancreatic and hepatic cells and the structures in which they are imbedded, are all endowed with vital properties, and the digestive and assimilative processes are *vitalizing* and not merely chemic changes. The chemist may mix any one or all the elements of food with either artificial or natural digestive fluids in glass tubes or earthen vessels and he may effect their solution, but he would never produce either true chyle, lymph or blood, much less an organized structure. As well might he put an unimpregnated ovum into his incubator, and expect in due time to have a live chicken instead of a decayed and odorous mass within the shell. While it is important that the quantity and quality of our food, and the times for taking it, should be duly proportioned to the amount and kind of retrograde metabolism or loss, it is equally important that we avoid those influences that habitually interfere with the due oxygenation and decarbonization of the blood or depress the functions of the pneumogastric and vasomotor nerves.

The occupancy of overcrowded or ill-ventilated rooms either for sleep or work; the neglect of sufficient open-air exercise during some part of the day; the eating in haste and the indulgence in intense mental activity, anxiety or violent emotions directly after meals or until late hours of the night; and the ordinary use of alcohol and tobacco, are the chief causes of those digestive disorders that have given us the credit of being a nation of "dyspeptics." And an analysis of their mode of action will show that all of them, either directly or indirectly, lessen the efficiency of the respiratory function and the internal distribution of oxygen. That close and persistent mental application in-doors lessens the depth of the respiratory act and consequently lessens the quantity of air used in the lungs and of oxygen imparted to the blood, has long been known.

And mental anxiety and depressing emotions much increase this effect, and sometimes suspend the secretion of gastric juice entirely while the stomach is full of food, while the effect of both alcohol and tobacco have been explained already. If it is an established fact, as previously stated, that oxygen is taken up from the air-cells by the blood-currents much more rapidly during active digestion of food, then certainly all the causes enumerated above should be avoided to the greatest possible extent during the taking of food and for one or two hours thereafter.

Our food should be taken with mental cheerfulness, without haste, and in an atmosphere of fresh, pure air; and for the next hour, at least, only moderate mental or physical labor should be engaged in and all obstructions to full respiratory movements avoided. The general observance of this simple dietetic rule would add immensely to the sum of human happiness, and materially prolong the average duration of human life.

A Valued Friend.—She: Dr. Reaper tells me that he is not only your family physician, but a warm friend of yours. He: Oh, yes indeed, and I can recommend him very highly. She: Has he ever treated you? He: No, not personally. But he was very successful with a wealthy aunt of mine.—*Hartshorn's Roller.*

FUNCTIONAL NERVOUS DISTURBANCES IN PULMONARY INVALIDS.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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During a six years' experience with pulmonary tuberculosis in Colorado, with opportunities for continued observation of cases, I have been enabled to note the very frequent association with this disease of the various forms of functional nervous disturbance. The conviction has arisen that there exists a relation more intimate than is perhaps generally recognized between these conditions, which may be justly considered the two most prevalent of American disorders.

A brief review of my clinical observations suggests itself as a means of directing more attention to this relationship, in the hope that ultimately further researches may afford a clearer conception of the subject. Without attempting to introduce any physiologic considerations, I will simply present the result of my own experience with reference to etiologic relations, prognosis, climatic influences and management. It is with much hesitation that I submit this report, realizing only too well the opportunities for error in the compilation of statistical records and the frequently resulting fallacies as to conclusions. I may state that while rather definite impressions as to certain phases of the subject have necessarily been received from daily general experience prior to the present inquiry, the study is here pursued without reference to any preconceived conclusions, with a view to securing more accurate information upon which to base opinions until then held in reserve. I am appreciative of the fact that the value of work of this nature depends entirely upon the authenticity of the records, the degree of intelligent discrimination possessed by the observer, and the most rigid and conscientious attention to detail.

Unfortunately, in a considerable number of the cases my records are incomplete from the standpoint of the neurologist. Some of the histories were imperfectly taken in this respect, and I am unable, therefore, to obtain complete data as regards family history and other etiologic considerations. It is hoped however, that the essential data are sufficiently complete to warrant approximate conclusions. I have preserved a record of 350 selected cases of pulmonary tuberculosis seen in private practice during recent years to Jan. 1, 1898. These cases have been subjected to continuous observation and have been carefully recorded. The list does not embrace those with very extensive infection, and hence with admittedly unfavorable prognosis. Neither are there many included with incipient trouble. The cases, on the whole, may be said to represent fairly the average class of pulmonary invalids in Colorado, exhibiting as a rule upon arrival moderately extensive and rather active infection. I make no effort at this time to classify the cases or report results with sole reference to the tubercular involvement, as this has been done to some extent in a previous paper.¹ It is my object to analyze them simply with respect to the relation between the nervous manifestations and the tuberculous condition. Of the 350 cases, 220, irrespective of any ner-

¹ Boston Medical and Surgical Journal, Sept. 16, 1897.

vous complications, are found to have shown improvement in Colorado. By improvement, without any further explanation, I allude to the varying degrees secured of partial arrestment. About two-thirds of the cases, taken as they come, have done well through a fairly extended period of observation, not including those who improved temporarily and later failed through intercurrent disease, accident or individual indiscretions.

I have divided the entire list into five classes with distinct reference to the nervous condition:

Class 1 numbers 164, or nearly half of all the cases, and represents those who may be considered to be free from any nervous manifestation whatever. Of these, 111, or nearly 68 per cent., have shown pulmonary improvement in Colorado.

Class 2 numbers 98, or nearly one-fifth of the entire list, and comprises those possessing distinctly nervous temperaments, but not presenting definite neuroses. Sixty-four of these have done well. Percentage of improvement, 65.

Class 3 contains 39, or rather more than one-tenth of the whole, and embraces those exhibiting slight neuroses. Twenty-four, or 61 per cent., have improved. Nearly all of this class were subjects of mild neurasthenia.

Class 4 has 33, or less than one-tenth of the whole, and includes those presenting *well-marked* neurotic disturbances. Thirteen, or 39 per cent., have improved. These cases manifested the severer forms of neurasthenia, chiefly of the depressed type, and moderate degrees of hysteria.

Class 5, numbering 16, comprises those individuals with pronounced neuroses, not included in Classes 3 or 4, but in whom the pulmonary involvement was very slight or insignificant. Eight, or 50 per cent., have improved with reference to the tuberculosis. All of this class were markedly hysterical.

In commenting upon these results it is interesting to note that the percentage of improvement in those with distinct nervous temperaments without neuroses, is nearly equal to that obtained in those devoid of all nervous tendencies, and is slightly above the average of the cases as a whole. A rational explanation of this would appear to be that such persons are usually more keenly alive to the importance of their condition, and are therefore more susceptible to advice, and more conscientious in following instructions as to the details of their mode of life. While, speaking broadly, the phlegmatic temperament in tuberculosis, is more conducive to good results than the irritable or nervous. I have repeatedly observed the greater ease with which the active co-operation and obedience of the patient could be secured in those with moderately nervous tendencies. With such there is usually no occasion for argument or explanation. A simple statement of directions is frequently sufficient to entail implicit compliance. As the nervous disturbances increase to some extent, however, the balance is at once thrown to the disadvantage of the individual, and in case of marked neuroses, is exerted powerfully in preventing or retarding improvement. Such influence is well illustrated in Class 5, where the pulmonary involvement *per se* in each instance was so slight as to almost insure recovery.

The further consideration of these cases is limited to Classes 3, 4 and 5, as being the only ones concerning which it is profitable to enumerate statistics. In these three classes out of a total of 88, 45 are shown

to have improved, and 43 to have done badly. Of the latter number, however, 12 had gained for a time in Colorado, but subsequently failed for reasons not to be attributed properly to climate. In Class 3 a history of neurotic inheritance could be traced in 18 instances, or nearly half the cases. Of these 11 have shown pulmonary improvement. In Class 4, 21, or nearly two-thirds, have shown evidence of hereditary nervous influence. Ten of this number have gained in Colorado with respect to the tuberculosis. In Class 5 hereditary taint was strong in 12, or two-thirds of the entire class. Six have shown slight pulmonary or general improvement.

Of the 88 cases in these three classes, 51 present a history of an inherited nervous tendency, 13 may be fairly considered to be acquired, and 24 are in doubt, with no tangible means of ascertaining the facts.

Somewhat to my surprise the relative number of cases improved appears to be not materially different in those with inherited tendencies from the proportion obtained for the entire list, or for those without neurotic taint. It is important to note, however, that there has been a decided difference observed as to the *degree* of improvement, the gain usually being much slower and frequently more unsatisfactory in those with a history of nervous inheritance. I have occasionally recognized the pure acquirement of the nervous disturbance, or at least, its conspicuous aggravation to be developed from an intimate association with others afflicted with pronounced neurotic conditions. This has not been unusual in the case of husband and wife. I have not infrequently seen the development of nervous phenomena among several patients at the same resort attributable to the influence of a single subject of marked hysteria.

Thirty of the 88 cases with functional disturbance presented a history of inherited predisposition to tuberculosis. Of these 17 are also classed as subject to hereditary nervous influence. Fourteen of the 30 cases have done well in Colorado, despite the tubercular predisposition. Of the 17 cases, however, subject to *both* tubercular and neurotic hereditary influence, but 5 have shown improvement. The combination of the neurotic with the tubercular taint is apparently a factor of great prognostic moment.

The cases may be divided, irrespective of the degree of nervous disturbance, into three classes, with reference to the extent of pulmonary involvement. Without entering into a detailed explanation of the method of classification it is perhaps sufficient for present purposes to state that the first division includes those with comparative slight infection, the second those with moderate involvement, and the third those with extensive tubercular invasion.

Class A numbers 30, of whom 23 have shown pulmonary improvement.

Class B also contains 30, with 19 showing improvement.

Class C includes 28, of whom 3 have done well.

Attention is called to the fact that all the first class have gained except those with severe nervous complications; that more than half of the second class have improved, regardless of the degree or character of the nervous disturbance; and that, as illustrated in the third class, an extensive tubercular infection in neurotic individuals presents but slight hope of improvement.

As regards sex, there are 50 males and 38 females: The relative number of males is small in proportion

to the number in the entire list, from which these cases are selected. Of the 350 cases, 243 are males and 107 females. Thus only about one-fifth of the males are found to be subject to functional nervous disturbances, as compared with a little over one-third of the females. Twenty-two of the males with nervous disturbances, or 44 per cent. have gained, while 23, or over 60 per cent. of the females have improved. It is interesting to compare these figures with percentage of improvement obtained for males and females in the entire list. In the latter case the results are nearly equal, the female having a trifle over and the males a little under 63 per cent. These results as to the relative improvement in the sexes, singularly correspond with those obtained in a previous analysis of 200 cases in which the percentage for each sex was 69. The relatively greater gain made by the females with nervous tendencies over the males, is, I think, a striking confirmation of my former deductions concerning the influence of sex upon prognosis and management. I will quote briefly from my conclusions at that time:²

Despite obvious adverse conditions, and contrary to established conclusions, the female has responded to the favorable influence 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 can not 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 afforded for an existence in the open air, with judicious exercise, a life of more complete rest is assured, with perhaps 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 females in Colorado are in general relatively superior to those of the male. She does not usually seek change of climate unless proper provision has been made for her support.

If these premises are correct it is easy to understand how the female, although obviously more subject to neurotic conditions and more susceptible to nervous influences, nevertheless, in the face of the tubercular infection, is better equipped by virtue of her inherent and acquired tendencies, to withstand their unfavorable influences upon the course of the pulmonary disease.

It may be mentioned further that the improvement was more frequent in those who were relieved from domestic cares and responsibilities of children. As regards previous occupation it is enough to state that the gain in Colorado was decidedly more pronounced in those who had led sedentary lives. Two-thirds of these cases were Americans, the Irish and Hebrew races also showing a comparatively large number with nervous derangements.

With reference to the *character* of the nervous disturbance I am unable to effect a satisfactory classification. As the cases have been observed purely from a clinical standpoint, I will only allude briefly to the general nature of the neurotic manifestations, recognizing the difficulties of elaborating an arbitrary analysis. The cases are divided in a general way into

three classes, without reference to special symptoms.

The first includes thirty-four cases, presenting upon arrival evidences of considerable general restlessness with apparent exaltation of nerve forces. Twenty-one, or 64 per cent., have improved with respect to the lungs, while none have shown any perceptible increase of the nervous condition.

The second embraces twenty-eight cases exhibiting marked irritability of temperament with pronounced instability of nervous equilibrium. Ten, or 36 per cent., have shown pulmonary improvement.

The third includes twenty-six cases showing varying degrees of depression and hypochondriasis. Fourteen, or nearly 64 per cent., have improved.

A considerable number of the two latter classes have suffered aggravation of the nervous disturbances in Colorado, as will be considered later, either temporarily or corresponding to a coincident loss in the tubercular disease, or from purely external and easily attributable reasons. Three of each of these latter classes, however, are conspicuous examples of more or less continued exacerbation of the functional derangement from no well-defined cause.

These results are not incompatible with my general observations to the effect that in Colorado, as elsewhere, rather high degrees of irritability offer serious obstacles to a successful issue; that even considerable restlessness and excitation of temperament under appropriate management yields fairly satisfactory results; and that pronounced depression, while the type of neurasthenia exerting the most unfavorable influences upon the course of pulmonary tuberculosis nevertheless responds appreciably to the climatic change.

Insomnia and headaches were frequent special manifestations. Twenty-two suffered to a considerable extent from insomnia. Ten ultimately improved in this respect as well as in the lungs and general condition. In nearly every instance the gain has been slow and interrupted by periods of vexatious exacerbations of the sleeplessness. The majority of the remaining twelve showed no gain at any time, either in the lungs or the nervous disturbance. I have regarded the continued insomnia as of decidedly unfavorable influence upon prognosis, not merely from the loss of sleep and entailed exhaustion, but somewhat as an expression of the more profound nervous irritability with a general susceptibility to all depressing or exciting influences. Attention is called to the fact, although I am unable to give statistics, in this connection, that a very considerable number of pulmonary invalids obtain partial or complete relief in Colorado after having a more or less prolonged period of insomnia before arrival.

Fifteen of my patients were afflicted with migraine. Eleven have obtained relief, and have gained in other respects. In none of these cases however, have the headaches disappeared entirely. The degree of tubercular arrestment has been out of proportion to the neurotic improvement in this class. The latter has followed but slowly and unsatisfactorily a gain in the general strength. I have not sought, save in a few instances, to provide relief by attention to local causes.

Twenty-seven were victims of well-defined hysteria. Sixteen have shown pulmonary improvement, but remain subjects of the original neurosis, though some to a lesser degree on account of increased nutrition and suitable environment. Eleven had done poorly in every way, in eight of whom, as previously stated,

² Boston Medical and Surgical Journal, Sept. 16, 1897.

the pronounced hysteria was directly responsible for the unfortunate results.

An inquiry as to the *time of development* of the disturbances is perhaps of some interest. Of the 51 cases with hereditary influence the manifestation of the nervous condition was apparent in nearly every instance before the recognition of the tuberculosis, but was very frequently aggravated subsequently. Of the 37 in whom no family history of neurotic taint could be discovered, 10 may be considered safely to have exhibited rather pronounced symptoms before the onset of the tuberculosis but which became more marked later; 12 only after the development, or coincidentally with it, and 15 unknown. Apparently the effect of the tuberculosis has been to render the pre-existing nervous disturbance more pronounced, to increase the susceptibility to such influences in those already predisposed by inheritance, and to provide the appropriate conditions for the acquired development, i. e., impaired nutrition, mental depression and auto-intoxication. Likewise, the previous existence of well-marked functional nervous derangement can but afford added opportunities for the development of tuberculosis, from the lessened resistance of the individual, and hence the increased receptivity of the soil to the agent of infection. Impaired general nutrition, while frequently a result, is also undoubtedly a potent factor in the causation of *each* diseased condition.

With reference to climatic influence, it may be stated that in almost no case were the manifestations of nervous disorder displayed for the first time in Colorado. Thirty-four cases suffered an aggravation in this State. Of these, 9 were rendered worse only temporarily and later improved satisfactorily in this respect. Twelve exhibited greater nervous disturbance coincidentally with a corresponding loss of the tubercular condition, with increased impairment of strength and general nutrition. Seven presented exacerbations to be referred solely to sufficient external causes capable of application anywhere, as excessive dissipation, extreme burden of business cares, and unfortunate domestic relations. The remaining 6 became worse, from a neurologic point of view, in the absence of any apparent cause. Of the entire number (34) rendered more nervous, either temporarily or permanently after arrival, 19 died as a result of the pulmonary infection or have grown worse. The balance at the present time are showing varying degrees of improvement. Nine of these have made a remarkable gain in all respects, despite decided nervous disturbances.

Finally, of the 45 cases previously alluded to as having exhibited distinct pulmonary improvement, 39 showed an ultimate gain in the nervous disorder, and of the 63 cases showing no permanent loss, or doing well from the neurologic standpoint, 39 have improved with reference to the tuberculosis. Thus the results are:

Improved in both conditions	Cases. 39
Improved in tubercular but not in nervous condition. 6	
Improved in nervous but not in tubercular condition. 24	
No improvement in either.	19

The reasonable interpretation of this would appear to be, that the influence of the climate upon the nervous condition had been particularly advantageous in a large proportion of the cases, presumably by virtue of the pulmonary improvement secured with the increased nutrition. It is also evident that the climate

has been not unfavorable, to say the least, for the considerable number who either showed an improvement or no change neurologically, notwithstanding a progressive loss in the tubercular disease. These conclusions are of interest in view of the oft-repeated assertion that the co-existence of nervous manifestations contraindicates a recourse to the Colorado climate for the consumptive. The statement of the alleged aggravation of the nervous condition with the resulting unfavorable influence upon the course of the pulmonary disease, presupposes the hypothesis that improvement in the functional disturbance must precede arrestment of the tubercular infection, and at the same time advances the argument that the nervous derangement is of more essential consideration than the tuberculosis. It has been my observation that the nervous disturbances have diminished almost invariably in proportion to the degree of arrestment and the gain in the general strength. I am convinced that the majority of cases temporarily aggravated, or even developed early after arrival, are due in great measure to purely psychical influences, as enforced absence from family and friends, inability to immediate adaptation to strange surroundings, and previously accepted theories as to probable climatic effects. Such cases usually respond favorably later to rational and appropriate management. It should, however, be conceded, I think, that occasionally certain cases, especially those with strong inherent tendencies and severe manifestations, do poorly, particularly in the high altitudes of Colorado. These cases have been comparatively few in my own experience.

While the existence of pronounced nervous conditions in pulmonary tuberculosis constitutes a factor of grave prognostic moment in any location, it would seem that the climatic consideration of the tubercular infection per se should be regarded as of paramount importance. I would also insist that the especial significance of functional nervous disturbance in pulmonary invalids, should be to add further emphasis to the necessity of strict personal attention to details of management, environment and mode of life.

A FASCICLE OF CASES IN SUGGESTIVE (HYPNOTIC) THERAPEUTICS.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-ninth Annual Meeting of the American Medical Association held at Denver, Colo., June 7-10, 1898.

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The American medical world has shown itself easily affected, as a rule, by the current of events, medical and surgical, in Europe. The experiments of Koch with tuberculin, of Klebs, Loeffler and Roux with antitoxin, and the various suggestions with reference to organic extracts—cerebral, testicular, thyroid, etc.—that have crossed the Atlantic have received a ready attention, in some cases developing into a wave of enthusiasm, and have found practical recognition in employment by many of our progressive medical brethren. I would refer merely to the disappointment that some have experienced in applying these more or less authoritative procedures, and remark *en passant*, that the wisest of us are subject to mistake occasionally through the very earnestness of our desire to wrest from old Mors one at least of his dreaded instrumentalities for human decimation.

In view of the readiness of the American profession