

they exhibited the slightly indurating surface indicated in the drawing. They were not at any time, however, very vascular. The elements constituting this morbid growth were nucleated fibres, nucleated cells, fibres, and filamentous tissues. The nucleated cells were of an oval figure, united together to form masses, and were the chief elements of the entire mass. Much of the fibro tissue exhibited a double outline, and the nuclei of all the elements became much more distinct when treated with dilute acetic acid.

This tumour clearly belongs to the class described by M. Lebert under the term fibro-plastic, but whether arising primarily in the remains of effused blood, or originating in a bursal formation, or in a simple cyst developed in the areolar tissue, the walls of which had continued slowly to increase in thickness, must remain a subject of speculation and doubt.

FURTHER OBSERVATIONS ON THE CAUSE OF TUBERCULOSIS;

WITH SUGGESTIONS AS TO ITS PREVENTION.

By JAMES G. ATKINSON, M.D.

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IN corroboration and extension of the views I advanced in a former number of *THE LANCET*, as to the probable cause of tuberculosis, my object is to show that the earliest stage of the disease consists in a diminished vital power, produced by various external depressing agents; that this results in a more energetic oxidation of the tissues, as a consequence of the amount of vital force having been thus lost, which retained the elements of the azotized principles in the form, order, and structure which belongs to them, and thus affording a less means of restraint against the incessant tendency of the oxygen of the atmosphere to act on their elements; and I attempted to show that tubercular deposits may, from the above causes, be regarded as the consequence of an irregular metamorphosis of tissues, and that these may be retarded, if not prevented, by the substitution of various forms of carbonized material, and that the only class of medicinal agents which may be considered decidedly prophylactic are those which sustain the vital tenacity in opposition to the chemical effects of oxygen. Of this latter class, alcohol appears to hold a prominent place; and in addition to the facts which I have already brought forward, I will here quote the opinions on this head of Dr. Cotton and Mr. Ancell in their recently published works, which go far to substantiate my views as to the fact of alcohol being in many instances one of the safeguards from tuberculosis. The former says, in the treatment of phthisis before tubercle is deposited, that "Wine or beer in moderate quantity should be included in the diet list, and I have seen conscientious scruples upon this matter overcome on many occasions with marked advantage."* We also find that Mr. Ancell, although differing very much from Dr. Johnson and others, gives the following statement on the prophylactic powers of alcohol:—"Facts are not wanting which tend to establish that the tuberculous constitution, where there is no local disease, is benefited by the moderate use of these fluids, (alcoholic,) and this is sanctioned by theory, but then the stimulus must be moderate, uniform, constant, and accompanied by a generous diet, containing a proper proportion of these stimulant principles, and essential elements of food, &c."† He also quotes Dr. Peters, who remarks, that "Alcohol would seem to produce a state of blood opposite to that which obtains in this disease, and may thus prevent the development of it; and that the excessive use of alcohol does not destroy life by producing tuberculosis, but rather by producing other diseases, as those of the nervous system and of the liver."

It is very true that no hypothesis can take the place of statistical evidence; but it is rather more difficult than what at first sight appears to be, to collect a sufficient amount of data to establish the truth or falsehood of my position. I have, however, endeavoured to furnish an approximation to correct results by examining the registries of deaths in this town for the last ten years, commencing on the 1st of May, 1843, to the 1st of May, 1853; and although I am aware the numbers are far too small to justify a decisive conclusion, they are, as far as they go, satisfactory. All will admit that perhaps no class takes more alcoholic stimulants, in proportion to the rest of

the inhabitants, than publicans. Thus I have selected these out by way of experiment, to ascertain the relative mortality from phthisis in this class of men. I have arranged the deaths under the four following heads:—

Deaths from general diseases	...	...	...	3329
" " phthisis	...	...	...	541
" " general diseases in publicans	...	...	...	25
Phthisis in publicans	...	...	...	2

It appears, therefore, from the above figures, that rather more than one-sixth of the deaths amongst the whole population of the town arise from phthisis, whereas in publicans scarcely one-twelfth die from this disease during the same period. But these numbers, if taken without correction, fall far short of representing the real disparity between the deaths from phthisis among publicans, as compared with the deaths occurring from phthisis among the population at large; for the 3329 represents the deaths at all ages; but as about one-half of that number occurred in persons under fifteen, and as persons rarely die of phthisis under fifteen, and as publicans are all above fifteen, the figures should stand thus:—

Deaths above 15	...	...	...	1665
" from phthisis	...	...	...	541
Publicans' deaths	...	...	...	25
" " from phthisis	...	...	...	2

Showing a general mortality among adults from phthisis of rather less than 1 in 3, and in publicans, 1 in 12½. Now, allowing great latitude for accidental mistakes, still the mortality by phthisis in publicans is comparatively small. What a more extensive investigation would prove, it would be difficult to say; however, there is here sufficient to demand further inquiries.

These facts are, I am aware, at variance with the observations of many excellent writers. I find Sir James Clark, nearly twenty years ago, remarks:—"We believe that the abuse of spirituous liquors among the lower classes in this country is productive of tuberculous disease, to an extent far beyond what is usually imagined—indeed, it is only necessary to observe the blanched, cadaverous aspect of the spirit-drinker to be assured of the condition of his internal organs." Again, "the cases that are likely to be cured by the stimulating plan of treatment—by beef-steaks and porter—bear so small a proportion to the many that would be injured by it, that we do not consider it deserving of further notice."* The late Dr. Graves, of Dublin, many years later, however, writes in a very different strain, and it is evidently apparent that medical opinion is by no means agreed on this subject. He says:—"Make your patient lay aside slops and tea; let him take wholesome fresh meat, bread, and good beer; the good diet will invigorate the system, and so far from producing inflammation, will do exactly the contrary."† It may, however, be shown that in some cases drunkenness and dissipation have, without any doubt, been proved to be the positive exciting causes. This we do not for a moment deny, and in some instances they indubitably are; yet this admission does not invalidate the strength of my proposition; for I believe that every cause which tends to lower the vital tonicity acts as an exciting cause in producing tuberculosis, and nothing is more likely to depress the system than the secondary effects resulting from drunkenness and dissipation, and therefore in this manner these may in some instances be productive of this disease. It is the temperate use of alcohol for which I contend, which, by retarding a too quick metamorphosis of tissues, checks or prevents the protein compounds from being too readily acted on by oxygen, which state occurs in the enfeebled, or in those hereditarily predisposed. In a word, then, the abuse of alcohol may be an exciting cause in producing tuberculosis; whereas, on the other hand, a moderate supply of this compound might possibly be used as a preventive agent in persons predisposed to phthisis.

I might assert that it is almost the fashion of the present day to consider tuberculosis strictly a blood disease. Mr. Ancell avers, "that the progressive debility is the progressive decrease of vital molecular changes, first in the blood, and secondly in the solids." This statement appears to require some consideration. Is it not more probable that the solids first give way? for of whatever the vital force may ultimately prove to consist, whether arising in consequence of certain molecular arrangements in the particles of matter, or from other unknown causes, yet with our present knowledge it may

* *The Nature, Symptoms, and Treatment of Consumption.* By R. P. Cotton, M.D. Page 200.

† *A Treatise on Tuberculosis.* By Henry Ancell, Esq. Page 458.

* *Cyclopaedia of Practical Medicine*, vol. iv. 1835, on "Tubercular Phthisis." By Dr. Clark. Pages 321 & 353.

† *Clinical Lectures.* By Dr. Graves. Vol. ii., page 103.

be regarded as an inherent force, and liable from disease or accident to be diminished in intensity; therefore, from the many causes which are known to lower the health, it would appear that this inherent force, which keeps together the molecules of the organism, is so far weakened as to allow oxygen to act upon the various elements with a greater degree of intensity than in a normal state; and if this be so, it is evident that the solids of the body ought rather to be considered as the primary seat of the disease. Vogel says: "All attempts to demonstrate such a specific principle in the blood have failed, and the difficulties of satisfying ourselves of the presence of a specific cytoblastima of this kind, differing from the normal nutritive fluid, are so great, that the correctness of such observations may reasonably be called in question."* We have also the authority of Virchow, (quoted from the *Medico-Chirurgical Review*, No. XVI., p. 186,) who says that tubercle is not developed exudation, but merely metamorphosed pre-existing tissue-elements—elements to which in their primary state the name of tubercle could not be applied; and that, consequently, the tuberculous metamorphosis is not the mark of a specific process of a particular constitution. Again, this author states that tuberculization, the indubitably local process by which the body described by the name tubercle is formed, is not a peculiar specific exudation, but a peculiar transformation of tissue-elements, &c. (p. 187.) It seems, however, that it may be so far regarded a blood disease, if we suppose that the oxygen, conveyed by means of the red corpuscles in the arterial blood to any part where a low degree of vitality exists, combines more readily with the carbon of the metamorphosed tissues, and thereby removes with an abnormal rapidity the carbon of these tissues. The remaining elements, now in a soluble state during this act of transformation, are carried away by the veins towards the heart, but not being in their usual and normal elementary proportions, are extremely liable to form new and abnormal compounds; for we must bear in mind that the metamorphosis of tissue, which is constantly going on in the adult and healthy man, is so evenly balanced, that exact portions of carbonic acid, urea, water, bile, &c., are daily formed, so that the man neither gains nor loses weight; indeed, this is carried on with so much precision, that the "amount of tissue metamorphosed in a given time may be measured by the quantity of nitrogen in the urine;"† but if from any cause, a disturbance in the equilibrium arises, it is natural to suppose that during the transformation of tissue great irregularities in these compounds might take place; for, as Liebig shows that "all the organic nitrogenized constituents of the body, how different soever they may be in composition, are derived from protein;"‡ "but if one of the forces necessary for vitality be impeded, the form and structure of the compound may be so far altered by these means, as to produce the resolution of the compound into one or more compounds with altered properties;"§ therefore, as the arterial blood in phthisis contains a larger proportion of oxygen, and, at the same time, the vital tonic is weakened; the result is, in the first place, a larger quantity of carbonic acid generated; and, hence, some of the usual compounds in the metamorphosis of tissue cannot be produced, in consequence of their wanting the precise quantities of carbon. This being the case, recollecting that tubercle consists of the elements of tissue, with a deficiency of carbon, I propose it, as a strong probability, that in tuberculosis, the elements of protein are deposited, minus certain proportions of carbon. This is, in fact, tubercle, and the foregoing reasons are sufficient to lead me to suppose that this is the correct theory of its formation; but we can go still further, and by an antithetical mode of argument, show, that when the blood becomes too highly carbonized tubercular deposits rarely, if ever, occur; for "Rokitansky attaches great importance to an increased venosity of the blood, as an antagonistic to the formation of tubercle; and, under this head, he includes every influence which interferes directly or indirectly with oxygenization of the blood, either by diminishing the capacity of the chest, or hindering the expansion of the lungs, or by deranging the pulmonary circulation of blood, or by impeding the free access of air thereunto: for example, a case of spinal deformity narrowing the chest; a case of abdominal tumour encroaching upward, and causing dyspnoea; a case of cyanosis maintaining deficient aëration of the blood; these would be cases in which, according to this observer of hundreds of thousands, the tubercular deposits would not arise."|| "Again, it is somewhat remarkable that in those parts of the body where the access of oxygen is impeded, peculiar compounds, containing

much carbon, are given out: for example, in the arm-pits, or in the soles of the feet."** We have attempted to show that when the vital powers are lowered tubercular deposits generally occur; now, according to Vogel,† that when the system is lowered in typhus, depositions are found in various parts of the body, similar to those in scrofulosis, the essential difference being, that the whole proceeding is accomplished more rapidly in one than in the other, and it is frequently quite impossible to distinguish tubercle from typhus matter. He, moreover, quotes Engell as an authority, that in proportion to the weakness of the vital powers, so the facility for tubercular deposition is increased.

It would, indeed, be a work of supererogation to give a detail of many of the well-known causes productive of tuberculosis. I may, however, just allude to the fact, that nearly all the writers of the present day have abandoned the ancient hypothesis of inflammation being ranked as the common cause of this disease. Every fact observable, both in man and in the lower animals, shows that whatever tends to depress and lower the system renders it eminently liable to a deposition of tubercle. Most of the cows kept in the stables at Paris die phthisical,‡ which effect certainly cannot be ascribed to cold. Phthisis, again, is more frequent, at all ages, with females than males.§ The occupations of seamen, butchers, and tanners are, on the other hand, generally considered unfavourable to the occurrence of consumption.|| Lombard calculated that the disease is only one-half as prevalent among persons in easy circumstances as it is among the great bulk of the population. Phthisis also frequently follows both continued and intermittent fever, so close as to make them appear exciting causes; and to this list we might also add dyspepsia. The disposition of this disease, again, appears to be strongest in that condition of the body called lymphatic; whereas, when the system seems to be more highly vitalized, such as probably occurs in pregnancy, this condition appears to retard, if not to suspend, its progress; and finally, as Dr. Todd observes, "it is easy to understand how this nutritive matrix, either from deficient vitality, or some other condition, may be formed of a nature below the standard of organization, and how in this state the nutritive molecules may, instead of tissue, be converted into tubercles;"—all which evidence corroborates my views, that the first stage of phthisis may strictly be considered as one in which the vital force is acting with diminished resistance.

It has recently been advanced that the condition of the body favourable to the development of cancer is almost incompatible with that of tuberculosis, or, as Mr. Simon observes, "the one excludes the other."¶ In cancer, this author alleges there is an obstinate excess of vitality, which will not be quenched. Now, if the first step favourable to the deposition of tubercle be a want of vital power, does the foregoing fact concerning cancer antithetically uphold my proposition as to the first stage of tuberculosis? or, in other words, as the organism is acting with more than a normal energy in one disease, and with a diminished vital power in the other, does this, I repeat, account for tuberculosis and cancer being incompatible in the same body?

From the foregoing, we draw the following conclusions:—

1st. That the ratio of mortality from phthisis, in publicans, is less than one-fourth of the ordinary ratio among other classes of the adult population.

2nd. That the first step in tuberculosis seems to consist in some molecular change in the substance of the body—probably owing to a deficient vital attractive power among the particles—and that compounds like alcohol act by sustaining this attraction.

3rd. That phthisis is characterized by an excess of oxygen circulating in the system; and that when the blood becomes too highly carbonized from various diseases, tubercles are not deposited—to wit, in cyanosis, &c.

4th. That deposits similar in constitution to tubercle are produced under other circumstances than phthisis, and that this always occurs when the vital system is lowered—as, for instance, in typhus; and, on the other hand, when the vital force seems to be in excess, which takes place in cancer, tubercles are seldom if ever formed.

Lastly. From these we infer that the treatment most likely to prevent deposition will be generous living—wine, beer, &c.—

* Vogel's Pathological Anatomy, translated by Dr. Day, p. 278.

† Liebig, p. 245.

‡ Ibid., p. 107.

§ Ibid., p. 207.

|| Braithwaite's Retrospect, J. Simon, vol. xxii., p. 153.

* Liebig, p. 29.

† Vogel, Pathog. Anat., pp. 274, 285, 288.

‡ Louis, p. 507.

§ Ibid., p. 483.

|| Treatise on Consumption, by James Clark, pp. 58, 224, 249, 255, 259.

¶ Braithwaite's Retrospect, vol. xxii., p. 155.

with tonics; and that medicines containing much carbon, as cod-liver oil, tannic acid, &c., are of use, as furnishing a pabulum by which the excess of oxygen in this disease may become saturated, without acting upon the tissues.

South Parade, Wakefield, 1854.

ON HEADACHE AND ITS VARIETIES.

By PATRICK J. MURPHY, M.D.

(Continued from p. 183.)

Headache.—This variety is known as cephalæa, vertigo, megrim, or giddiness. Its history shows that it arises from a deficiency of blood within the cranium. It is relieved in the recumbent, and increased in the erect posture. The sensation may be most annoying on retiring to rest, yet on awaking in the morning it is either altogether gone or very much less. Rest, generous diet, and stimulants oppose its encroachments; exertion, diet small in quantity and bad in quality, great loss of the fluids from diarrhoea, perspiration, lactation, epistaxis, or leucorrhœa, add to its intensity. The mind even may become unsound, for it is not uncommon to meet with mothers in the lower classes of life, who, compelled by necessity to toil all day, deprived of rest at night by the cries of their infants, unable to obtain sufficient nourishment, and hourly drained by lactation, whose symptoms, beginning with this variety of headache, are soon preyed upon by low spirits, succeeded by the deepest melancholy; and, if now closely questioned, they will confess they are continually apprehensive of imbruing their hands in the blood of that very offspring for whose welfare they have sapped the foundations of body and of mind. The records of the daily papers unfortunately too well testify that in many pitiable cases I have not overcoloured the picture. A suicidal tendency is also an attendant idea in other extreme cases. What an intense headache follows uterine hæmorrhage! the slightest noise is unendurable, and the head cannot be raised from the pillow without inducing syncope.

Dimness of vision, a symptom seldom absent in cases even moderately advanced, as it occurs occasionally only, seldom continues more than a few seconds, and is not very annoying, it will not be alluded to by the patient unless inquired after by the physician. When the headache is very severe, *muscæ volitantes* are noticed. It is identical with that temporary loss of vision preceding syncope. If the cause be not removed, functional amaurosis may follow, which, if treated by depletives, might be permanent.

Countenance, lips, and tongue pale.—No proofs are required that paleness in parts naturally red must arise from a deficiency of blood only.

The sunken eye and dark semicircle beneath the eyelids are well known to denote a languid circulation, as well as some degree of emaciation.

Coldness of the extremities, surface of body chilly.—These attendant symptoms, which are always present, corroborate the idea, that in the central organ of circulation resides the primary cause of the headache, and the other symptoms already enumerated. Fear and anxiety depress the action of the heart, and chill the surface of the body. The cold bath, which lessens so speedily the impulse of the heart's action, and if prolonged would rapidly abstract caloric from the body, and check its motions for ever. Cool the cutaneous surface, and you lessen the beats of the heart; lessen the beats of the heart by a mental emotion, or by digitalis, and you cool the cutaneous surface. Reverse the medal, and we discover that whatever quickens the circulation diffuses warmth over the surface.

Palpitation of the heart; feeble pulse; dyspnœa on slight exertion.—Palpitation is either organic or functional. If the former it is persistent, the pulse is strong and incompressible, and the heart beats with such force against the parietes of the chest as to be sensibly felt by the hand or ear when placed over the cardiac region. These symptoms are reversed when the palpitation is functional and from mere weakness; the pulse is languid and compressible; the heart is quiet during repose, and disturbed only from mental excitement or physical exertion; the impetus is feeble and diffused; and if the person lie in the recumbent position, and the heart be thus withdrawn from immediate contact with the walls of the chest, its beats are scarcely perceptible.

Both the palpitation and dyspnœa are the effects of blood being poured more rapidly into the cavities than the heart in its then weakened state is able to expel. Of course we all know that muscular exertion forces blood to the heart, and therefore there is a demand on the organ for increased action

termed palpitation, and not being able to empty its cavities completely and rapidly enough, there is an impediment to the entrance of the blood from the pulmonary veins and consequent pulmonary congestion which induces dyspnœa.

Cramps, which are very usual symptoms, have never been suspected to depend on a flaccid heart. A cramp arises when there is an impediment to the circulation of the blood in a vein which traverses the substance of a muscle. The heart therefore, when flaccid, not being able to keep up an active circulation, is a cause of cramp. The enlarged uterus, by pressing on the iliac veins causes cramps in the same way. The severe pain of cramp is owing to the pressure which the muscular nerves endure. Cramps from a flaccid heart are only felt in bed, when the contractions of the muscles of the leg have ceased. The involuntary action of the muscle, although painful, is salutary, for muscular contractions are a great aid to the circulation. The cramps of cholera are also owing to the stagnation of the blood in the muscular veins. Having published in THE LANCET, a few weeks since, a short paper on Cramp, any more remarks here are unnecessary.

Disturbed sleep; dreams.—If during sleep the free action of the heart be impeded, the sleep is broken, disturbed, and attended with unpleasant dreams. A person with a flaccid heart lying asleep on his left side, and thus checking the motion of the ribs, is almost certain to be annoyed with nightmare or unpleasant dreams. It is singular and inexplicable why these dreams should be always of a distressing nature: tumbling down, fire, drowning, or thieves, are the usual subjects. In organic diseases, sleep can scarcely be indulged in, unless in a semi-recumbent position, without the intrusion of these unpleasant dreams. We may therefore conclude, that where headache coexists with disturbed sleep and disagreeable dreams, we have to combat with a flaccid heart; nor can I recal to memory one well-marked case of chlorosis where those dreams were not acknowledged.

Sighing, gaping, and yawning, are closely related to each other; they are natural and necessary acts to relieve præcordial oppression. If the attention be engaged, and the heart not acting strongly, the pulmonary veins are over-distended, and sighing—which is merely taking a deep breath, and calling the diaphragm into full action—becomes necessary to expand the pulmonary tissue.

Sinking of the epigastrium is one of the most constant symptoms. This symptom is difficult of explanation, but it seems analogous to the sensation of hunger. Certain it is that food relieves and abstinence increases it. The appetite is craving; but with some persons, although there is great desire for food, yet hunger is easily appeased; and if there be the slightest over-indulgence, distension, tympanitis, and borborygmi follow. The tympanitis I have usually considered as the result of the muscular coats of the intestines and stomach partaking of the general weakness of the voluntary muscles, which thus yield readily to the gaseous pressure. The muscles, both organic and inorganic, are enfeebled. There is a wish for stimulants even by young females, and also by females who display almost every symptom of chronic gastritis, such as nausea, vomiting, and pyrosis. If, therefore, there be no pain on pressing the epigastrium, and the appetite and wish for stimulants are present, it would be mistaken practice to deplete or give hydrocyanic acid or other sedatives.

Œdema of the Ankles.—Many diseases produce this symptom, especially those which drain the system. In prolonged chlorosis it is not infrequent, and denotes a flaccid heart, unable to exhaust the veins of their blood. To the same cause must be attributed this symptom co-existing with anæmic headache. It does not appear early, sometimes it is denied, although it will be admitted that towards night the shoes are too tight for the feet. In the delicate and relaxed female the plantar fascia readily yields to the effused fluid; but in more advanced age, and especially in those of once rigid fibre, I have been consulted for this symptom alone in the incipient stage; for then there is severe pain along the sole of the foot, which subsides if the recumbent position be adopted for a few hours, returns when the upright posture is re-assumed, and, if not properly treated, is not relieved until cedema explains the cause. In connexion with cedema of the ankles may be also mentioned enlargements of the liver and spleen. The increased volume of the liver is a well-known effect of organic affections of the heart, especially of adherent pericardium, but has not been noticed, as far as my recollection goes, as a very common effect of a flaccid heart. In debilitated women, who have had a family, it is by no means uncommon to be consulted for a pain in the right hypochondrium; and if the side be examined while she stands, the practitioner is surprised to discover the liver