THE CROONIAN LECTURES ON FUNCTIONAL DERANGEMENTS OF THE LIVER.

Delivered at the Royal College of Physicians.

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LECTURE III.

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MR. PRESIDENT, FELLOWS OF THE COLLEGE, AND GENTLEMEN,—In my last lecture I considered some of the more important diseases and symptoms resulting from abnormal disintegration of albuminous matter in the liver. I have still to refer to certain derangements of the organs of circulation and respiration, and abnormal states of the skin traceable to the same cause. I shall then mention some of the chief causes of functional derangements of the liver, and conclude the lecture by a brief sketch of the principal rules for treatment of these derangements.

VI.—*Derangements of the Organs of Circulation.*

1. *Palpitations and Flutterings of the Heart*.—Indigestion has long been regarded as one of the causes of palpitation independent of organic disease of the heart. Many patients with this functional derangement of the heart describe their sensations as that of a transient fluttering rather than a continuous palpitation; and when this feeling of fluttering comes to be investigated, it usually turns out to be produced by a strong thump of the apex of the heart following one or more weaker beats or a decided stop. In some of these cases of palpitation and fluttering, a prominent symptom of the indigestion is flatulence; and then the common explanation of the cardiac symptoms is, that they are due to the pressure upon the heart of the distended stomach and bowels; and this explanation receives support from the fact that, on the removal of the flatulence, the cardiac symptoms are often relieved or cease. But in other of these cases the flatulence may be entirely removed, while the cardiac symptoms remain, while in others there is not the slightest evidence of flatulence, and still the cardiac symptoms are removed by remedies, such as alkalies and aperients, calculated to improve the condition of the liver. It seems probable, therefore, that in some, if not in many, cases, when flatulence and palpitations coexist, they do not stand in the relation of cause and effect, but are both the result of a common cause. Palpitations, and still more, flutterings of the heart, are particularly common in gouty people, whether they suffer from dyspeptic symptoms or not. Every one present must have met with cases of the sort. Scudamore relates cases in which patients suffered from severe palpitations for six months without any relief from medicine; but, on the occurrence of a fit of gout, the palpitations suddenly and entirely ceased.* Dr. Garrod, in his work *On Gout*, remarks: "One of the most common symptoms produced by a gouty state of the system is palpitation of the heart, often accompanied by irregularity of its rhythm, and occasionally with pulsation of some of the larger arteries. In the majority of these cases, the condition is secondary to dyspepsia,

but at times it may be directly excited by the impure condition of the blood; and I have notes of some cases in which no organic mischief could be discovered in the heart, nor any signs of indigestion, and the symptoms ceased on the occurrence of gout in the joints."† These cardiac symptoms are also very common in persons who are the subjects of lithæmia, but who never have gout. They are often the first symptoms to draw the patient's notice to the fact that his health is not what it ought to be; they cause great depression of spirits; and very often they are aggravated by injudicious treatment, and especially by the use of iron, which may seem to be indicated by the patient's anæmic aspect, but which is rarely tolerated until the liver has been brought into a healthy state by alkalies, aperients, and attention to diet. Although in the cases now referred to, the cardiac symptoms result from pneumogastric irritation by a poison in the blood, the fact already referred to must not be lost sight of, that this same morbid state of blood may ultimately lead to degeneration of the muscular wall of the heart, or disease of the aortic valves.

2. *Exaggerated Pulsation of the Large Arteries*.—Dr. Matthew Baillie, in a communication made to this College on December 2nd, 1812, was the first to call attention to cases of increased pulsation of the aorta in the epigastric region, simulating aneurism, but in some instances lasting twenty-five years or longer, and the result merely of "imperfect digestion with an irritable constitution".‡ This exaggerated pulsation, not only of the aorta, but of other arteries, independent of either contracted kidney or aortic regurgitation, is now well known; and one cause of it appears to be a morbid state of blood resulting from derangement of the liver, and often associated with gout. Scudamore relates cases of palpitations in the head occurring in persons afflicted with bilious derangement and gout; and likewise the case of a gentleman who had gout and bilious derangement, and who suffered alternately from palpitation of the heart and pulsation of the aorta in the epigastric region.§ Garrod also speaks of an irritable state of the aorta and pulsation of the larger arteries as occasionally resulting from gout.§ The undue pulsation in these cases is often subdued by treatment directed against the liver.

3. *Irregularities and Intermissions of the Pulse*.—An intermitting pulse, which may, or may not, be attended by the sensation of fluttering of the heart already referred to, may result from a variety of causes, of which the principal are these.

a. *Valvular and other diseases of the heart*. In organic diseases of the heart, however, irregularity of the rhythm is more common than decided intermission.

b. *A weakened or unduly irritable state of the nervous system*, such as that which often occurs in old age, or sometimes appears to be constitutional, or those which are induced by fevers, delirium tremens, hysteria, protracted want of sleep, anxiety, etc.

c. *Morbid states of the blood, associated with gout or lithæmia, or with other evidence of hepatic derangement*. It has been the fashion to attribute the intermission in these last cases to pneumogastric irritation by gastric dyspepsia or flatulence; but, just as we found in vertigo, there is very often neither flatulence, nor other evidence of gastric derangement; and my experience has led me to the conclusion that in most of these cases the pneumogastric irritation has a toxic origin, or is due to the presence in the blood of some morbid material resulting from derangement of the liver. What this material is, we do not with certainty know. It is not uncommon for the pulse to become very slow, or even to be irregular or to intermit, in jaundice. These symptoms do not appear to be due to the presence of bile-pigment in the blood, for in many cases of jaundice they are absent; but some experiments made a few years since by Röhrig showed that the bile-acids paralyse the heart and retard its action, while bile-pigment has no such effect.|| It is possible, then, that slowness and intermission of the pulse may be caused by the presence in the blood of unchanged bile-acids, even in cases where there is no jaundice; but more probably the cause of the intermission is some other product of albuminous disintegration, inasmuch as it is so commonly met with in connection with lithæmia or gout, and as it is often entirely removed by blue pill, saline aperients, alkalies, and attention to diet. A notable fact in these cases is that the tendency of the pulse to intermit is usually greatest when the patient is at rest, and is diminished or ceases on his taking exercise. As in the case of vertigo or sleeplessness, the intermission may be excited by particular articles of diet. It may last for many years, during which the patient may enjoy very fair health and be capable of considerable exertion. I lately saw a gentleman, aged 80, who had had an inter-

* *Nature and Treatment of Gout*, 1859, p. 510.

† *Medical Transactions*, published by the College of Physicians, 1813, vol. iv, p. 274.

‡ *Op. cit.*, p. 98.

§ *Op. cit.*, pp. 510, 511.

|| *Archiv für Heilkunde*, August 1863, p. 385.

* *Op. cit.*, pp. 16, 98, 374.

mitting pulse for upwards of fifty years. He had suffered from gout and dyspepsia, but in his eightieth year he could walk long distances and up moderate ascents without difficulty. It is also worth noting that intermission of the pulse may last for years, and then entirely disappear. Dr. C. Lasègue of Paris, who has published an interesting memoir* upon intermitting pulse, thinks that it is chiefly met with under two conditions, viz.:—1, as an accompaniment of some chronic general morbid state, which is the prelude of some more acute mischief, on the development of which the intermissions may cease; and 2, as the accompaniment of a general morbid state consequent on the first establishment of some local disease, the general cachexia and the intermitting pulse after a time disappearing, although the primary local disease remains. The following case, communicated to me by Mr. Paul Jackson, is a remarkable illustration of the complete disappearance of the intermission after a duration of several years, and also of its toxic origin.

About the year 1838, Mr. J. T., then forty-two years of age, of nervous temperament, a generous liver, and subject to hepatic derangement, began to suffer from intermission of the pulse, and a fluttering sensation at the heart. He had no dyspnoea or other symptom of cardiac disease, and there was no abnormal cardiac murmur. He saw a great many physicians, but got no relief; but, after upwards of three years, he had a severe attack of urticaria, whereupon the intermission and the fluttering entirely and for ever ceased. He lived for twenty years afterwards, and, with the exception of occasional attacks of gout and of sudden vertigo, he enjoyed good health. He died at last, however, suddenly, of rupture of the heart, at the age of sixty-five.

It may be well to add that, even when intermitting pulse coexists with valvular disease of the heart, it appears to be sometimes due to hepatic derangement rather than to the cardiac lesion. Take, for example, aortic incompetence. The rhythm of the pulse in this lesion is usually regular, but, in rare instances, it is irregular and intermitting. From the supervention of this symptom the patient's condition is often believed to have become more perilous, and yet there may be no aggravation of the other cardiac symptoms. The pulse may become regular, instead of more intermitting, after exercise, and the intermission may be entirely removed by the same remedies as are effectual when there is no cardiac disease. That the intermission of the pulse should be independent of the cardiac lesion is not surprising, when we remember that atheroma of the arteries, which is the main cause of aortic incompetence occurring in middle or advanced life,† and intermitting pulse, may both result from the lithic acid dyscrasia. The following case is an illustration of what I have just stated.

A discharged soldier, aged 56, came under my care in July 1873 for what appeared to be muscular or neuralgic pains. He was found to have aortic incompetence, but he had never had any symptom of cardiac disease—pain, palpitation, or dyspnoea—and he had been employed as a porter in a public institution, one of his duties being to carry heavy coal-scuttles up long stairs, from which he had apparently suffered no inconvenience. His pulse was quite regular. He was treated with quinine, but he left the hospital after some weeks not much relieved, and returned to his work. In December, he again came to me, complaining of pain in his right shoulder and constipation; his pulse was now very intermitting, and he had also a frequent feeling of fluttering about his heart. He had no other cardiac symptom, and, on walking, his pulse became regular. He was treated with blue pill, colchicum, aperients, alkalies, and iodide of potassium, and in a short time the pain in the shoulder, the fluttering, and the intermission disappeared.

4. *Feeble Circulation*.—In cases of protracted hepatic derangement, symptoms of feeble circulation, which may be independent of palpitations or irregularities of the pulse, are not uncommon. The patient complains of languor, debility, and coldness of the extremities. The heart is found to beat feebly, but to be free from organic disease; there is evidence of hepatic derangement, and the urine often deposits lithates. Iron, quinine, and alcoholic stimulants, which are frequently prescribed for this condition, may render the patient worse instead of better, and the surest way to increase the strength of the heart is to avoid alcohol and relieve the liver.

5. *Anæmia*.—(See page 474.)

6. *Angina Pectoris*.—The neuralgic affection known as angina pectoris probably arises in many different ways. One cause appears to be the lithic acid dyscrasia. It is now many years since an English physician, Dr. William Butler, described certain cases of this affection as diaphragmatic gout. The patients had been careless as to diet, and “particularly fond of the stronger malt liquors”; the urine deposited “a copious gross

sediment”; and the attack might terminate in a fit of the gout.* Many writers have since then described a “gouty cardialgia”; and, more recently, Trousseau has pointed out that certain cases of angina pectoris are independent of any disease of the heart or great vessels, and are merely “a manifestation of the gouty diathesis”.† Not long since, I saw a gentleman, aged 65, who complained of awaking in the night three or four times a week with violent pain in the cardiac region, extending up to the left shoulder and down the left arm. I could discover no sign of disease in his heart. He stated that, six years before, he had suffered for months from similar attacks, but had recovered under medical treatment. He had never had gout, but he was very careless as to his diet, and his brother I knew to be a martyr to gout.

VII.—Derangements of the Organs of Respiration.

1. *Chronic Catarrh of the Fauces*.—The subjects of gout or lithæmia are very liable to an habitual excess of mucous secretion in the fauces and at the back of the nose, which usually accumulates during the night, and which may be associated with a troublesome cough. Errors in diet usually increase the amount of phlegm, and may cause an extension of the catarrh, with hoarseness of the voice, and this may account for Scudamore's statement that a cough with much mucous secretion in the trachea sometimes precedes a fit of gout.‡

2. *Chronic Bronchitis*.—The researches of Trousseau,§ of our colleague Dr. Greenhow,|| and of other observers, have clearly proved that chronic bronchitis has in many instances a similar pathology to that of gout, and, therefore, originates in functional derangement of the liver. Gout and bronchitis are very common in the same families; gout is disproportionately common among bronchitic patients, and the two diseases often alternate with one another in the same individual, gout subsiding on the development of bronchitis, and bronchitis being relieved on the appearance of gout; while the bronchitis is benefited by the same remedies as are useful in gout. Moreover, persons who have never had gout, and do not come of a gouty stock, but who are the subjects of lithæmia, are also very prone to bronchitis.

3. *Spasmodic Asthma*.—Although spasmodic asthma consists essentially in a morbid proclivity of the musculo-nervous system of the bronchial tubes to be thrown into a state of activity, the stimulus to contraction appears in some patients to be toxic, or it consists in the presence of some morbid material in the blood. “When,” remarks Dr. Todd,¶ “the *materies morbi* of asthma has been generated, its effect is to irritate the nervous system, not generally, but certain parts of it, these parts being the nerves concerned in the function of respiration; viz., the pneumogastric and the nerves that supply the respiratory muscles, either at their peripheral extremities, or at their central termination in the medulla oblongata and spinal cord.” The nature of this *materies morbi* appears to be very similar to that of gout, and, like that of gout, it appears to be due to derangement of the blood-changes of which the liver is the principal seat. Asthma, like gout, is a hereditary disease; it is common among persons springing from a gouty stock; it is not unfrequently associated with gout in the same individual; and attacks of asthma have been known to alternate periodically with attacks of gout. Moreover, an asthmatic paroxysm, like an attack of gout, of vertigo, or sleeplessness, is often excited by a fit of indigestion and by the use of particular articles of diet. Our late colleague Dr. Hyde Salter, who did so much to throw light upon the pathology of asthma, was of opinion that the asthmatic paroxysm in the cases now referred to was produced by “the actual presence in the vessels of the lungs of the materials taken up from the stomach and intestines”;** but it seems to me that the *materies morbi* is far more likely to be a product of hepatic derangement consequent on the unwholesome ingesta, as in the analogous attacks of gout, vertigo, etc.

VIII.—Derangements of the Urinary Organs.

The remarks which I have already made render it unnecessary for me to insist further on the tendency of functional derangement of the liver to produce urinary symptoms. I will merely repeat that hepatic disorder is a common cause of:

1. *Deposits of Lithic Acid and Lithates in the Urine;*
2. *Renal Calculi;*
3. *Diseases of the Kidneys.*

I will now add that:

4. *Cystitis* is occasionally excited by the lithic acid diathesis.††

* *Treatise on Angina Pectoris*, second edition. London: 1806.

† *Op. cit.*, vol. iv, p. 379.

‡ *Op. cit.*, pp. 17, 377.

§ *Op. cit.*, vol. iv, p. 381.

|| *On Chronic Bronchitis*, 1869, p. 55.

¶ *Medical Gazette*, December 1850.

** *On Asthma*, 1860, pp. 46, 117.

†† See Garrod, *op. cit.*, p. 512.

* “Des Intermittences Cardiaques”, par le Dr. C. Lasègue, *Arch. Gén. de Méd.*, December 1872.

† I do not remember to have met with intermitting pulse in cases of aortic incompetence of rheumatic origin.

IX.—*Abnormal Conditions of the Skin.*

There is good evidence that many disorders of the skin originate in derangements of the processes of oxydation or disintegration which go on in the liver.

1. Almost all observers are agreed that *Eczema*, *Lepra*, *Psoriasis*, and *Lichen* may arise from lithæmia. Many years ago, the late Sir Henry Holland remarked that he had "so often seen psoriasis prevailing in gouty families—sometimes alternating with acute attacks of that disease, sometimes suspended by them, sometimes seeming to prevent them in individuals thus disposed—that it is difficult not to assign the same morbid cause to these results."* Our late distinguished President Sir Thomas Watson, in his *Practice of Medicine*, speaks of lepra and psoriasis as blood-diseases depending upon some poison bred within the body.† Dr. Garrod also bears testimony to the frequent connection of eczema and psoriasis with gout. My own experience fully bears out the correctness of these observations; but, in many cases, these cutaneous diseases appear to arise from the functional derangement of the liver which often precedes gout, although neither the patient nor any member of his family has ever suffered from this disease. On this point, Dr. Tilbury Fox, in his recent work on cutaneous diseases, makes the following pertinent remarks. "All disorders which are connected with retention of excreta in the system, and their circulation throughout the blood-current, may furnish the exciting cause of eczema. This is a clinical fact of very great importance. Given the tendency to eczema, then the transmission of uric acid through the capillaries of the skin will so far derange as to aggravate certainly, and now and again excite, an eczematous eruption. This is what is meant by gouty eczema; and, by securing the absence of uric acid from the circulation, the eczema will often disappear, and always be more amenable to treatment. . . . Such cases as I now refer to sometimes exist off and on for years, and are saturated with arsenic and mercurials, but are only relieved by recognising the complicating item of the free production and circulation of uric acid, and by instituting a *régime* calculated to arrest the continuance of those conditions."‡ Dr. Fox also calls attention to the fact that children with eczema have often white stools.§

2. *Urticaria* I have not unfrequently met with in connection with jaundice and other derangements of the liver. The late Dr. Graves observed eight or nine instances of persons suffering from acute rheumatism who became suddenly jaundiced from the supervention of hepatitis (congestion of liver?), and in whom the jaundice was followed by urticaria. Among the causes of urticaria, Dr. Tilbury Fox mentions "the circulation of acrid or effete products, for example, uric acid, bile, etc., which, coming to the surface, become oxydised and more active".¶ He also mentions that "asthma has been observed to be associated with urticaria in a peculiar manner"—an association which is readily explained by the foregoing remarks. Scudamore refers to violent urticaria as existing for two days before a gouty paroxysm;†† and I have myself known patients in whom champagne or certain articles of diet have almost invariably produced either gout or urticaria. Recently, I have had under my care a boy, aged 9, with *urticaria tuberosa* and *purpura urticaria*, complicated with hæmorrhages from the bowels, kidneys, and urinary passages, and with the discharge of much lithic acid in the urine, which there was good reason for suspecting to be due, in the first instance, to functional derangement of the liver.

3. *Boils and Carbuncles* are occasionally observed in connection with jaundice, and are also excited by the presence in the blood of urea and other effete products. In the connection also between phlegmonous or carbuncular inflammation and diabetes, it is possible again to trace the influence of a disordered liver in the production of skin-diseases.

4. *Pigment-spots* of various sorts on the face, hands, and other parts of the body, are not uncommon in functional derangements of the liver. They are sometimes designated "liver-spots" by non-professional persons, who, perhaps, attach too much importance to them as indicative of hepatic derangement. They may, as Dr. Laycock observes, be induced by imperfect oxydation or excessive production of carbon, in derangements of the liver,‡‡ but they may also arise in other ways.

5. *Xanthelasma or Vitiligoidea*, which consists in a fatty degeneration of the subcutaneous or submucous tissue analogous to atheroma,§§ is a remarkable affection of the skin, which was first described in a joint memoir by the late Dr. Addison and Sir William Gull.¶¶ It occurs in

two forms, either as tubercles varying from the size of a pin's head to that of a large pea, isolated or confluent; or more commonly as yellowish patches of irregular outline, slightly elevated, and not at all indurated. The tubercles are most numerous on the face and ears, on the outside and back of the forearms, and especially about the elbows and knees. The yellow patches are always first observed on the eyelids, usually near the inner canthus; but they may subsequently appear on the neck, the palms and flexures of the fingers, and even the gums. The more severe forms are almost always associated with persistent jaundice and great enlargement of the liver,* which may subside under treatment; and, in most cases where there has been no jaundice, the patients have been of middle or advanced age, and there has been a history of frequent and severe attacks of functional disturbance of the liver.† It may be added that several cases of xanthelasma have been observed where there has been diabetes, but no jaundice.‡ In some instances, the disease appears to be hereditary.

6. *Pruritus* is a troublesome symptom which often results from hepatic derangement. It is known to be a frequent accompaniment of jaundice; but it is not due to the presence of bile in the blood, for in many cases of jaundice it is absent, and I have repeatedly known it precede the appearance of jaundice by several weeks, or cease while the jaundice persisted. Moreover, I have frequently known itchiness of the skin a source of extreme distress to patients with hepatic derangement, but without any jaundice. It may attack various parts of the body in succession, or it may be universal. It is unattended by any eruption. It is always worse in heated rooms and after stimulating food, and it is greatly aggravated by scratching. This symptom is not uncommon in gouty people§ and in the subjects of the lithic acid diathesis, and it is often removed by attention to diet and a few doses of blue pill and alkalis. As Dr. Bence Jones has observed "itching, nettle-rash, eczema, and herpes are the outbursts of an over-acid state."||

C.—CAUSES OF FUNCTIONAL DERANGEMENTS OF THE LIVER.

The remarks which I shall make under this head will be restricted to abnormal disintegration in the liver. The causes of diabetes and of certain other functional derangements of the liver have been already referred to. The disorder of the liver which induces lithæmia may be primary, or secondary to other morbid states of the body. It is with the former that we are chiefly now concerned; but the main causes of secondary derangement of the liver may be briefly referred to. They are as follows.

1. *All structural diseases of the liver* derange more or less the functions of the organ. These derangements are usually judged of solely by the characters of the alvine evacuations, and the far more important functions of sanguification and depuration of the blood performed by the liver are lost sight of. But it is well to remember that in structural diseases of the liver these functions may be seriously deranged, without any obvious change in the characters of the stools. In all structural diseases of the liver unattended by fever and involving a considerable destruction of the glandular tissue, there is a tendency to a diminished excretion of urea, and an increase of lithates in the urine, and before long the patient becomes anæmic. At last, symptoms of blood-poisoning may supervene, although there may be no jaundice and plenty of bile in the motions. These results are well seen in acute atrophy of the liver; but are also notable, though in a less degree, in abscess, cirrhosis, cancer, etc.

2. *Disorders of the Gastric and Intestinal Digestion* often lead to secondary derangement of the liver. For example, the liver may become deranged as the result of gastric dyspepsia, or of protracted constipation from atony of the bowels or deficient intestinal secretion; and sometimes it may be difficult to say whether the hepatic derangement is primary or secondary.

3. *Diseases of the Heart and Lungs*, by obstructing the circulation and impeding oxydation, are a common cause of functional, and ultimately indeed of structural, disease of the liver. It is unnecessary for me here to insist on the frequency with which the symptoms of valvular disease of the heart are aggravated by those of functional derangement of the liver, and on the necessity of attending to these in the treatment of the primary disease.

4. *Pyrexia*.—In all diseases attended by pyrexia, whether arising from some general cause, such as a specific poison, or from a local inflamma-

* *Medical Notes and Reflections.*

† *Lectures on the Principles and Practice of Medicine*, fifth edition, 1871, vol. ii, p. 1023.

‡ *Skin Diseases*, third edition, 1873, p. 175. § *Id.*, p. 11.

|| *Clinical Lectures on the Practice of Medicine*, second edition, vol. i, p. 446.

¶ *Op. cit.*, p. 120.

** *Id.*, p. 121.

†† *Op. cit.*, p. 103.

‡‡ *Op. cit.*, p. 404.

§§ See *Pathological Transactions*, vol. xx, p. 187; and vol. xxiv, p. 242.

¶¶ *Guy's Hospital Reports*, second series, 1851, vol. vii, p. 265.

* See a fatal case recorded by me in *Pathological Transactions* for 1868, vol. xx, p. 187.

† See "Clinical Report on Xanthelasma Palpebrarum," by Jonathan Hutchinson, F.R.C.S., *Medico-Chirurgical Transactions*, 1871, vol. liv, p. 171.

‡ *Guy's Hospital Reports*, second series, vol. vii, p. 268; and Bristowe, in *Pathological Transactions*, vol. xvii, p. 414.

§ Scudamore, *op. cit.*, p. 103.

|| *Lecture on Pathology and Therapeutics*, 1867, p. 84.

tion, there is more or less functional derangement of the liver. The liver, indeed, plays a prominent part in the pathology of the febrile process. It is one of the few parts of the body which do not waste during the fever. On the contrary, it becomes enlarged and congested, while its gland-cells are swollen out with minute albuminous granules; and it is well known that these changes are attended by an increased disintegration of albuminous matter and an increased production of urea and less oxydised products. On the cessation of the febrile process the liver resumes its normal functions; but now and then it happens that, after a severe attack of fever, these functions are permanently impaired. I have repeatedly known a permanent tendency to hepatic derangement induced by a severe attack of typhus, enteric, malarious, or scarlet fever, in persons who had exhibited no such tendency previously.

Functional derangements of the liver, when primary, may be due to a variety of causes. Of these, the principal are—

I. *Errors in Diet.*—There can be no doubt that the present system of living, and especially the consumption of even what are regarded as average quantities of rich food and stimulating drinks, contribute largely to derange the liver. It will be generally admitted, nor would it be difficult to prove, that most persons are in the habit of eating a quantity of food far greater than suffices to maintain the nutrition of the body. Much of this excess is fortunately never assimilated and is got rid of in the fæces; but very often much more is taken into the blood than can be converted into tissue, or pass through the ordinary processes of oxydation preparatory to elimination. The result is that the excess of food is thrown out in an imperfectly oxydised form by the kidneys, lungs, etc., or accumulates in the system; while more work is thrown upon the liver than it can readily perform, and functional derangement of the organ ultimately ensues. With regard to individual principles of food, speaking generally, it may be said that the liver is most apt to be deranged by saccharine and fatty substances. The derangement of the liver which leads to lithæmia or gout is more likely to be induced by even small quantities of these substances than by a moderate excess of purely nitrogenous food, such as meat. Cooked articles of diet containing a large proportion of both sugar and fatty matter are in many persons certain to derange the liver. The excess of carbon in these substances must either be deposited as fat, or must take away the oxygen, so as to leave little free to act on the nitrogenous matter passing out from the tissues or derived from the food; and hence, as Dr. Bence Jones has observed in speaking of gout, “with carbonaceous diet in excess, the whole of the uric acid from the tissues might pass off through the blood unoxysed.”* There are also constitutional peculiarities with regard to many articles of food, which always derange the liver in certain individuals, though they are comparatively harmless in others; and some persons who are the subjects of lithæmia get on best with a vegetable diet and milk.

But of all ingesta the various alcoholic drinks are most apt to derange the liver. They do so in two ways. *a.* They may cause persistent congestion of the liver. Even small quantities of alcohol in healthy persons produce a temporary hepatic congestion; but if alcohol be taken in excess, or too frequently, the congestion of the liver becomes permanent, and the functions of the organ are deranged. Like results may ensue from comparatively small quantities in certain persons, who may be said to have a constitutional intolerance of alcohol. Of course, if the congestion be long maintained, structural disease may follow. *b.* But wines and other alcoholic drinks often cause derangement of the liver, which a corresponding quantity of pure alcohol would not produce, and which, in fact, cannot be accounted for by any one ingredient of the offending liquid—neither by the free acid, the ether, the salts, gum, sugar, or extractive matter. This general rule, however, I believe holds good, that the injurious effect of alcoholic beverages upon the liver increases in a direct ratio with the amount of sugar plus alcohol which they contain. It would seem, indeed, that a mixture of alcohol and sugar produces injurious results, which would not be caused by the admixture of a much larger quantity of sugar, or of alcohol alone, with the food. In accordance with this view, the alcoholic drinks which are found from experience to be most apt to disagree with the liver are malt liquors of all sorts, but especially porter and the stronger forms of mild ale, port wine, madeira, tokay, malaga, sweet champagne, dark sheries, liqueurs, and brandy; whilst those which are least likely to derange the functions of the organs are claret, hock, moselle, dry sherry, and gin or whiskey largely diluted.

Derangement of the liver from excessive eating or from other errors in diet usually first shows itself in middle life—from 35 to 45. Young people, who take much exercise, and whose bodies are still undergoing development, require more food, and can often with impunity eat more than they require. But by the age of 40 the body is fully developed,

and most persons take less exercise than before, while at the same time they often indulge more freely at table. At any age, errors in diet will be all the more likely to tell upon the liver, if there be any constitutional weakness in the functional power of the organ.

[To be continued.]

TEDIOUS LABOUR FROM DEBILITY, AND ITS TREATMENT.

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THE remarks in this paper apply exclusively to labours protracted from debility, but, in other respects, natural. I, therefore, expressly exclude from consideration all cases in which the delay arises from the position of the child, or from an abnormal condition of the passages, and also cases complicated with rigid os uteri, or with spasmodic contractions of a tetanic nature, as well as those in which there exist obstructions arising from inflammation or from surgical interference. My remarks have reference solely to cases in which the delay is due to enfeeblement or failure of the natural powers of the organs specially called into action during the process of parturition.

Most obstetric writers apply the term “tedious” to all labours protracted beyond a certain period, whatever be the cause of the delay. While it appears to me that the physiological conditions of the case preclude the possibility of fixing for all cases a definite period, many obstetricians, following Dr. Ramsbotham, limit the definition of the term “natural labour” to those cases “in which not more than twenty-four hours are occupied from the commencement of true uterine action to the termination of the process”. And the same author, in defining lingering or tedious labour, says that it denotes those cases “in which nothing calling for anxiety occurs, except the length of time that elapses under the continuance, so that it differs from a natural labour only in respect of its duration”. Is not this method of basing a classification of labours on the element of time highly unscientific? It is in the first stage of labour that the longest time is occupied, and it is in that very stage that the consideration of the factor time is of the least consequence. It is to the natural differences of temperament that we must attribute the greatly diverse energies with which the organs act in different individuals. The standard of natural labour is one, therefore, that should have reference to the conditions under which the organ contracts, and assuming no unnatural formation to obstruct its progress, it should not be held to have passed into the category of non-natural labour as long as the pains are active, and the labour progressive.

Uterine action may be said to be a violent effort to expel a body in contact with the cavity which is no longer in harmony with it. The action is kindred to that of the bladder in evacuating urine, or to that of the heart during the systole. Taking the latter as the type of uterine action, analogy would teach that labour pains result only when the distension is sufficient to produce uniform contraction; and, having once set in, the action proceeds in a truly peristaltic manner until the organ has been emptied of its contents. The rapidity of the action causes it to be mistaken for a simultaneous general contraction. The nerves which control the womb's action are not those of common sensation, but the sympathetic, which becomes a nerve of sensation only in special circumstances. The true contractions of the uterus originate among the fibres of the cervix and end at the fundus. Were the functions of this organ, like that of the other organs, performed by muscles composed of involuntary fibre, the contractions would be painless. Labour-pains, however, are spasms—violent efforts by an organ to throw out a substance which has ceased to be in harmony with it. Recent observations show that the onset of uterine action is due to a decadence of the membranes, or of the membranes and placenta, and each recurring pain indicates a renewed effort to effect expulsion. Painless uterine contractions do take place, as, for instance, in primiparæ after delivery; but these lack the force to expel other than liquid substances. Under healthy uterine action, then, the rapidity of the delivery bears a direct ratio to the force and frequency of the pains. In certain cases, no doubt, natural labour is hastened or retarded by other circumstances. Thus, in primiparæ, it is usually prolonged from an obvious cause, while, in phthical cases, it may be accelerated from the attenuated state of the passages. In the case of a woman of average strength, where the pains are regular and effective, the uterus of a multipara may perform its function with sufficient vigour to complete the parturient act within two hours. Dr. Haughton of Dublin and Dr. Duncan of Edinburgh have made independent investigations on the propelling power of the uterus. The maximum power of an uterine contraction is estimated by Dr. Duncan to be equal to 50 lbs., and by Dr. Haughton 54 lbs. The uterus has thus three times the amount of power necessary to complete an uncon-

* *Op. cit.*, p. 142.