

## Original Communications.

### ON EXOPHTHALMIC GOITRE.

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[Read to the Medical Section of the Manchester Royal Institution, Manchester.]

In selecting the subject of Exophthalmic Goitre for my paper, I have been influenced by the fact of having seen, perhaps, more than an average of these cases, and been intimately acquainted with their histories.

It is only within the last few years that this disease has excited much attention in England, although in Ireland, France, and Germany, it has been studied by various inquirers under different names; as "Glotzaugen Cachexie" (Basedow); "Exophthalmos ac Struma cum Cordis Affectione" (Henoeh); "Exophthalmie Sereuse" (Datin); "Anæmic Exophthalmos" (Mackenzie); "Cachexia Exophthalmica" (various); "Anæmic Protrusion of the Eyeballs" (Taylor); "Affection of the Thyroid Gland" (Graves); "Affection of the Heart and Thyroid Gland" (Stokes); "Maladie de Basedow" (Hirsch); "Maladie de Graves" (Trousseau); "Anæmia and its consequences" (Begbie); etc.

CASE I. The first case that I noticed was in August 1858, at which time I was requested to see a Mr. C., aged 26, whose father and mother were said to have died of phthisis. He was a nervous excitable subject; had previously enjoyed excellent health; never had piles. He was the principal in a business requiring considerable mental exertion; just previously to this time he had been very much engaged, working night and day; and had lost a great deal of rest, from anxiety about business matters and family troubles, having the responsibility of being guardian to his orphan brothers and sisters; he had also a matrimonial engagement that was near its consummation. He had been in the country for the end of the week, to pay his last visit as a bachelor to some friends; took freely of the good things peculiar to such feasts; and, after a sleepless night, started back to town by an early morning train; felt very cold, and soon after he arrived home (August 2, 1858), had a rigor; and was seized with very severe *colic*, that continued in spite of the free use of antispasmodics for twenty-four hours. The bowels were relieved by enemata; still the *colic* returned from time to time for five days, when he passed *one gall-stone*. After this he gradually recovered, but was so much reduced as to be unable to walk about his room for eight or ten days. Knowing as I did, that he was engaged to be married in about ten days, and that his plan for a wedding tour was to spend a month or six weeks in France and Italy, I proposed that his matrimonial engagement should be adjourned until he had perfectly recovered his strength. Of course, my wishes were not attended to; he was married, went his tour, and returned one month from the day of his starting. On the evening of his return, I was requested to see him, as it was "thought he could not live long." I found him (September 28, 1858) sitting up; able to walk a short distance, and then failing, not for want of muscular power, but from the severe palpitations, caused by the slightest motion or excitement.

He was greatly emaciated, his clothes hanging upon him in folds. The eyes protruded to a considerable extent, and were more than ordinarily brilliant. The rest of his face was pale, sickly, wasted, and expressionless; no wrinkles nor painful expression, but rather a want of it; yet the peculiar staring of the eyes gave him a most wild look, intensified by every motion of the body, or mental excitement. The colour of the skin was peculiar,

being something between the paleness of simple anæmia and slight jaundice; differing from the greenish yellow of chlorosis or the malignant tinge. When he was spoken to, the face flushed slightly; the eyes started more from their sockets; he complained of increased palpitations, throbbing in the neck and head, and constriction about the throat, which caused him to remove all covering therefrom. He complained of the heat of the room (although it was a cold night), and requested the fire removed, and the window to be opened; evincing a great tolerance of cold, and intolerance of heat. Upon examining the heart, it could be felt beating in its normal situation with a tumultuous jerking impulse. (He observed this symptom three days after his marriage.) The palpitations were increased by alteration of position and excitement to a considerable extent, giving him the idea, as he expressed it, "as if it would jump out of the chest or burst." There was a loud systolic murmur extending along the great vessels. On percussing the region of the heart, I did not observe any increased vertical or horizontal dullness. The carotids could be seen beating most violently, and gave a loud *bruit*. The abdominal aorta could be felt pulsating in the same way through the thin wasted abdominal walls; and here also the *bruit* was heard. The radial pulsations were 136 per minute, full and soft; during excitement they had some of the violence and irregularity of the carotids, but at all times there was a marked difference in the radial and carotid pulsations. The thyroid body was enlarged; the lateral lobes being each of about the size of a duck's egg, the right a little larger than the left; it was soft to the feel, conveying a thrill to the fingers and a *bruit* to the ear. During excitement, the gland increased in size, the thrill and *bruit* were increased. He noticed the enlargement of the thyroid gland fifteen days after the palpitations, eighteen days after his marriage. There was a distinct venous murmur in the jugulars. The abdomen was flat, and gave out the normal physical signs, except the pulsations and *bruit* of the aorta, and increased vertical and lateral dullness over the regions of the liver and spleen. The limbs were much wasted, the tissues hanging flabbily to the bones; there was slight œdema of the ankles. The eyes projected from the orbits; by pressure of the finger the protrusion could be diminished, but it returned on the removal of the pressure. He could move the eyes freely in any direction, but the tendency was to look straight out. The coats of the eye were not injected. Vision was perfect; but there was a great disinclination to read, because the fatigue and consequent excitement caused an increase of the palpitations. The skin was cool except during a paroxysm of excitement, when it was covered with a clammy perspiration. The urine was slightly increased in quantity, specific gravity 1021, pale, acid, deficient in urea, but otherwise normal. The tongue was clean, except near the base, where there was a creamy fur. He had much thirst, the desire being for acid liquors. Whilst on the continent, he had taken freely of the light acid wines, which were no sooner taken than rejected, as he thought, from their not agreeing with him; he, therefore, day by day changed his wine, without any different result. This irritability of the stomach had troubled him during the convalescence from the attack of *colic*; and up to the time of his leaving England, he had only been able to take milk diet, without great risk of its being rejected. His appetite was variable and capricious, the desire being for highly seasoned soups, which were frequently rejected. In this way he accounted for the emaciation. He had diarrhœa during the first ten days, the stools being "dark and bilious"; then constipation, which still continued. The bowels had not acted for three days before this evening; the motion was scanty and pale. He complained of inability to sleep; he could not lie upon the left side in consequence of increase of the palpitations, nor on the right side from difficulty of breathing,

nor on his back from constriction of the throat; the only way in which he could sleep was in a semirecumbent position, or upon his stomach. For more than three months, he said, his sleep had been disturbed and unrefreshing, from mental anxiety; and now, he thought, "sleep had almost forsaken him." He went to bed with a fixed impression that he would not get an hour's sleep, and arose in the morning, nervous, fretful, irritable, and morbidly anxious. He had gone to bed night after night of late, rising in the morning worse than on the previous day. He gave this as the reason for sitting up in his present emaciated condition.

The treatment consisted of nutritious, unstimulating food, in small quantities and at short intervals; a full dose of morphia at night to produce sleep; digitalis to steady the heart; and tincture of sesquichloride of iron to improve the condition of the blood.

He was under this treatment for a month; and at the end of December 1858 went to the west coast for a month without medicine, and returned perfectly well. The improvement in the symptoms followed the order of their appearance; better nights, less irritability of the stomach, more perfect digestion, diminished excitement of the heart, gradual loss of *bruit*, sinking of the eyes, and diminished goitre. When he left for the seaside, there still remained a little of the goitre, but it was quite gone on his return. Up to the present time (over four years), he has enjoyed perfect health, and passed a critical examination in London in connection with a life assurance society.

CASE II. Mr. G., a relation of my own, aged 28, married, of nervous temperament, never was ill, except from dyspepsia and jaundice four years ago. He never had piles; his habits were regular and temperate, in the ordinary acceptance of the term; but he was very intemperate in tea-drinking; he thought this often kept him from sleeping at night, and induced his dyspepsia and palpitations. In the spring of 1859 he had to battle with a number of severe calamities and business troubles, "the anxiety of which kept him awake night after night." Then came the irritability of the stomach; food of all kinds except the most bland being rejected. He had also great thirst. Bilious diarrhoea, alternating with constipation, now troubled him. The specific symptoms were the same, and came on in the same order, as in the last case; except that there was a greater extent of dulness over the region of the liver. The skin was more of a dusky yellow colour; the conjunctiva was slightly yellow. Early in July, the palpitations were first noticed; in August, the exophthalmos came on, and ten days later, the goitre. All the symptoms in this case were more severe than in the last.

The treatment was as in the last case, except that hyoscyamus was substituted for the morphia, which did not procure sleep. The improvement was immediate and gradual; in two months, he went to the sea-side, where he remained for six weeks, returning without heart-symptoms, exophthalmos, or goitre. He has since remained in good health. The blood in this case coagulated slowly and imperfectly; under the microscope, there was seen to be a deficiency of red corpuscles and an excess of white cells.

CASE III. John M., waiter at an hotel, married, aged 37, had previously very good health; he lived freely, was frequently kept up the greater part of the night, getting very little sleep, and what he did was disturbed and unrefreshing.

On September 20th, 1859, he consulted me for what he considered to be heart-disease, that had been gradually getting worse for four months. He could not give an exact account of the accession of the symptoms. He now complained of sleeplessness and irritable stomach; his bowels were constipated; the stools were light in colour. He had no piles. He had heart-symptoms, exophthalmos, and goitre, well marked. He was

under the same treatment as the other cases for four months, and was then perfectly cured.

In May 1860, from anxiety and other causes, his sleep again became uncertain, disturbed, and unrefreshing; the palpitations and a slight *bruit* returned. A few doses of morphia were given at night, and he recovered. He has since enjoyed good health.

CASE IV. A girl, aged 16, who had always been delicate, feeble, and stunted, was thought to have heart-disease. She had never menstruated. In May 1860, she came under my care, for excited heart, goitre, and exophthalmos. The treatment was the same as in the other cases, and was continued for seven months, with gradual improvement, ending in perfect recovery, and establishing of the menses. She has since this time continued in good health, and grown considerably.

CASE V. Mrs. H., aged 37, had been married six years, but had not had any children. She had been regular, had no abnormal discharges; she had very good health previous to her marriage. For the last three years, from irregularities in the habits of her husband, her rest had been very uncertain and broken. She had considerable mental and emotional excitement, from which her health had given way. She suffered from dyspepsia and vomitings; once she had "slight jaundice, followed by bilious diarrhoea," which left her very weak, and brought on the palpitations.

On October 10th, 1861, she first consulted me. She was then greatly emaciated; hardly able to walk. She had a very loud systolic *bruit* almost obscuring both sounds, with goitre and exophthalmos.

The treatment was the same as in the other cases, and was continued for eight months, ending in perfect recovery.

CASE VI. I am indebted to my friend Dr. Ledward for this case. Mrs. H., aged 47, married five years ago; had no hereditary tendency to disease; always had good health previous to her marriage. She menstruated regularly up to the last four years, when the catamenia ceased. She did not remember ever being without leucorrhœa. She married a widower with a family of grown-up children; and during the first two years of her married life had great trouble and anxiety with them. She frequently went to bed and lay awake all night thinking of her troubles, and got up disinclined to take, and unable to digest, her food. Three years ago she first noticed the palpitations, weakness, and emaciation. She could not fix the time of appearance of the other symptoms. She had now exophthalmos and goitre; a slight *bruit* only was heard in the carotids, but not in the heart. Pulse 130. The blood coagulated slowly and imperfectly; the red corpuscles were deficient; it contained cholesterine. The fœces were pale, and contained a considerable quantity of cholesterine; also, a trace of bisterate of soda, and very little stercorine. Mr. Hudson has checked this examination. Mr. T. Windsor found some atrophic changes in the choroid coat of the eye.

Dr. Thorburn has very kindly given me notes of three cases he has met with.

CASE I. A man, aged 35, with palpitations, emaciation, goitre, and exophthalmos (double), was treated with iodine and hydropathic remedies without benefit. He was first seen on June 26th, 1861. It was a well-marked case, with the usual symptoms of vomiting, disturbed digestion, nervous excitement, goitre, and exophthalmos.

The treatment consisted of ice to the goitre, soda water and milk, mild unstimulating diet, morphia, and iodide of iron. In two months, he was much better; and by the middle of 1862 was strong and well, a little of the exophthalmos remaining.

CASE II. A female, aged 40, had the usual symptoms, but in a mild degree. Her sister had been treated for symptoms resembling aneurism of the aorta, unsupported by physical signs, with iodide of potassium; it

was given in this case for eighteen months, with only diminution of the symptoms.

CASE III. A female servant, aged 29, had symptoms resembling the last case. Iodide of potassium was given internally; and iodide of lead applied to the goitre with improvement. The case was then lost sight of.

In searching the literature of this subject, I find that, in the year 1722 (*a*), Saint-Yves gives cases of exophthalmos, evidently of this kind. In 1774 Louis (*b*), and in 1791 Gilibert (*c*), relate cases. In 1800 Flajani (*d*), an Italian, first alluded to goitre in connexion with palpitations. After him, Wardrop (*e*) in 1809, Testa, Wenzel and Ware (*f*) and Demours (*g*) in 1818, also noticed the disease. Dr. C. H. Parry of Bath (*h*) says "he has so often seen this swelling (goitre) follow diseases of the heart and other maladies more especially called nervous, such as epilepsy, etc., in which the blood is propelled with excessive momentum to the vessels of the head, and yet at the same time has observed such sudden augmentation and diminution of the swelling," that he was led to suspect that the thyroid body acted as a diverticulum to the cerebral circulation. The same writer, in his posthumous (*i*) works, alludes to a case he saw in 1786. Middlemore (*j*) and Brueck (*k*), etc., in 1835, Hamilton in 1836 (*l*), Pauli (*m*) in 1837, and Datin in 1839, give cases of goitre with palpitations, and exophthalmos with palpitations. Yet there is no account of cases where the three so-called characteristic symptoms are given, before the time of Dr. Graves (*n*) in 1835, who evidently was the first to distinguish this disease, although there cannot be a doubt that both Flajani, Parry, and others, alluded to these cases. In the year 1840, Basedow (*o*), in Germany, entered more fully into the subject, with cases to illustrate his statements. In 1841, Sir H. Marsh (*p*) exhibited to the Dublin Pathological Society the heart of a case that had resulted fatally, and alluded to other cases. Graves (*q*) in 1843 enlarged upon his former statements. The disease has also been described by Sichel (*r*) in 1844, McDonnell (*s*) in 1845, White Cooper (*t*) in 1849, Mackenzie in 1850, Naumann (*u*), Romberg, and Henoch in 1851, Desmarres (*v*) in 1853, Stokes (*w*) and Schoch (*x*) in 1854, Charcot (*y*) in 1855 and 1857, Begbie (*z*) in 1855, Taylor (*aa*) in 1856, Hervieux (*bb*) in 1857; in America, in 1859, by Flint (*cc*), Taylor, Biglow, Moreland, etc.; in France, an excellent memoir by Fischer (*dd*), with a very complete bibliographic account

of the subject; in Germany, by Withusen, translated by Dr. Moir (*ee*); in 1860, Genoville (*ff*), Gros (*gg*), Demarquay (*hh*). Dr. Williams and others, at the London Medical and Chirurgical Society, discussed the subject. In 1861 Aran (*ii*) and H. Walton (*jj*), in 1862 Begbie (*kk*) and Trousseau (*ll*), have enriched the subject by cases and comments.

**PATHOLOGY.** The earliest record of a *post mortem* examination I have met with is in an examination of a supposed fatal case of heart-disease, given in the *Edinburgh Medical Journal* of 1820, vol. i. The thyroid gland was much enlarged, scirrhus, adhering to and pressing on the left carotid. (Goitre had existed several years.) The body was much emaciated. The pericardium adhered to the heart; it contained four ounces of brownish serum; the heart was enlarged and thickened, particularly the left ventricle, which was filled with coagulated blood. The aorta was enlarged at its origin. There were specks of ossification over the surface of the heart. The liver was greatly enlarged, and its structure much deranged. The mesenteric glands were enlarged and diseased. The spleen was enlarged, and contained an abscess filled with dark coloured pus. The kidneys were much enlarged, but the structure was not much changed. Sir H. Marsh, in 1841, exhibited to the Dublin Pathological Society the heart of a case to which he had alluded before. The left auricle was enlarged, not hypertrophied; the capacity of the right auricle was increased, but in a less degree than the left; and there was a little hypertrophy of its walls. The left ventricle was hypertrophied and dilated. There was thickening of the mitral valve; other valves healthy. No account of the other viscera. Hirsch in 1840 (*Casper's Wochenschrift*, March 28th, 1840) examined a case that died comatose; he found blood in the arachnoid cavity, and over the left hemisphere; brain injected; thyroid body hard; vessels dilated; heart slightly hypertrophied; valves healthy; not much fat in the cavity of the orbit. Naumann in 1851 gave an examination where the left ventricle was hypertrophied, the aortic valves ossified, with insufficiency of the mitral valves, atheroma of several arteries, as ophthalmic, etc.; dilated veins; orbital fat increased; aqueous humour thick, with crystals of cholesterine in it; capsule of the lens opaque; coats of the eye more or less injected. Heusinger (*mm*) found the cellular tissue in the orbit in two cases yellow, thick, and increased in quantity. Präel, in 1854, found the cellular tissue in the orbits not much increased; the jugular veins were much dilated; and the heart fatty. In 1857 (*nn*), he examined a man aged 50, that had died from this disease; and found hypertrophy with dilatation of the left heart; the mitral valves thin; atheroma and osseous degeneration; diseased aorta; and the brain in some parts softened. Lécorché (*oo*) examined a fatal case with albumen in the urine. He found serosity of the membranes of the brain. The heart was enlarged, the left ventricle hypertrophied, the valves healthy; the kidneys were diseased. Roche, in a fatal case with hæmoptysis and coma, found an apoplectic clot in the brain, and fluid in the pleura and pericardium. The kidneys were diseased; the heart was large; and there was œdema of the cellular tissue of the orbit. Ferrand relates a fatal case, but there was nothing special in the *post mortem* examination. Begbie gives a case of Dr. Christison's, where the body was much emaciated, the right cavities of the heart dilated, the walls

(a) Nouveau Traité des Maladies des Yeux, chap. xx, page 141. Paris: 1722.

(b) Mém. de l'Acad. de Chir., t. xiii.

(c) Adversaria Medico-Practica.

(d) Collezione d'Osservazioni di Chirurgia, vol. iii, p. 270.

(e) On Fungus Hematodes.

(f) Observations on the Treatment of Epiphora.

(g) Maladies des Yeux, t. i, p. 484.

(h) General Pathology, vol. i, p. 188.

(i) Posthumous Works of Dr. C. H. Parry, vol. ii, p. 111. 1825.

(j) Treatise on Diseases of the Eye, vol. ii, p. 589. 1835.

(k) Ammon's Zeitschrift, Band iv. 1835.

(l) Dublin Medical Journal, vol. ix, p. 255.

(m) Heidelberg. klin. Ann., Band iii, Heft ii. 1837.

(n) Clinical Lectures, vol. ii, p. 193.

(o) Casper's Wochenschrift, 1840.

(p) Dublin Journal of Medical Science, vol. xx, p. 471.

(q) Clinical Medicine, p. 674.

(r) Bulletin Général de Thérapeutique, t. xxx, p. 344.

(s) Dublin Journal of Medical Science, vol. xxvii, p. 200.

(t) Lancet, May 26, 1849, p. 551.

(u) Deutsche Klinik, 1853 and 1854, p. 24.

(v) Gazette des Hôpitaux, 1853, p. ii; and Maladies des Yeux, t. i, p. 210, 2nd edit.

(w) Disease of the Heart, p. 278. 1854.

(x) De Exophthalmo ac Strumâ cum Cordis Affectione. Berlin: 1854.

(y) Gazette Médicale de Paris, 1856; and Mémoires de la Société de Biologie, 1857.

(z) Edinburgh Medical Journal, vol. lxxxii. Case-book. 1855.

(aa) Medical Times and Gazette, p. 515. May 25, 1856.

(bb) L'Union Médicale, 1857.

(cc) A Practical Treatise on Diagnosis, etc., of Diseases of the Heart, p. 267.

(dd) Archives Générales de Médecine, t. xi, pp. 521 and 652. 1850.

(ee) Dublin Medical Press, July 1850.

(ff) Archives Générales de Médecine, t. i, p. 82. 1860.

(gg) Archives Générales de Médecine, t. xi, p. 238. 1860.

(hh) Traité des Tumeurs de l'Orbite, p. 157. 1860.

(ii) Archives Générales de Médecine, t. i, p. 106. 1861.

(jj) Surgical Diseases of the Eye, p. 301. 1861.

(kk) Practical Medicine, p. 116. 1862.

(ll) Clinique Médicale, t. xi, p. 614.

(mm) Casper's Wochenschrift, 1851.

(nn) Archiv für Ophthalmologie, t. iii, p. 187.

(oo) Theses, 1858.

of the right auricle thin, the valves healthy, the right pleura adherent, and the left healthy. The thyroid gland was much enlarged from hypertrophy. The stomach was displaced downwards; its mucous membrane was healthy. The intestines were glued together by old adhesions, but their mucous membrane was healthy. The liver was congested, indurated, and had the nutmeg appearance. The spleen was large, but healthy. One kidney contained a cyst. The other viscera were healthy. The blood was fluid in every part. Begbie then relates the examination of a fatal case of his own, in which there had been engorgement of the liver, jaundice, signs of diseased heart, general dropsy, and exophthalmos for more than a year. The body was moderately stout; there were evidences of decomposition going on. The cellular tissue contained very little fat, but was infiltrated with serum. The pericardium was large, and contained six ounces of clear yellow fluid. Upon the anterior surface of the heart, near the base, a milky spot of about the size of a florin-piece was observed, and another upon the opposite surface of the pericardium. All the cavities of the heart were filled with dark coloured blood, more fluid than usual; one well formed decolourised clot was found in the right ventricle. The heart was large, soft, and flaccid; all its chambers, especially the ventricles, were dilated. The tricuspid and mitral valves were large, but otherwise normal; the sigmoid valves were normal. The vena cava inferior was large; the aorta was small, compared with the pulmonary artery. The endocardium and inner surface of the aorta were stained of a deep red colour; both pleuræ contained dark red turbid fluid. The sterno-hyoid and thyroid muscles were thinner and broader than natural; the external jugular veins were normal, the internal large. The thyroid body was generally increased in size to four or five times its normal extent; it was of a dusky red colour, well defined, but slightly irregular on its anterior surface. The kidneys were large and soft. The liver was certainly not enlarged, perhaps rather small; its surface was somewhat irregular, slightly fissured at points superficially. No rounded nodules of cirrhosis could be observed. On cutting the tissue, it was rather hard and dense. The organ seemed partially atrophied; its colour was of a deep orange; and in some places there was an approach to nutmeg congestion.

The ETIOLOGY of this disease is obscure and doubtful. It is allowed to be rare in children, although cases have been recorded by Louis, Coulon, Demours, etc. It is more common in females than males, as proved by Taylor, G-noville, Withusen, etc.; yet it is by no means rare in males, for Fischer, Romberg, Taylor, Aran, White Cooper, Trousseau, Begbie, and others, have recorded cases. It may coexist with, and is thought to be to some extent depending upon, wasting discharges, as leucorrhœa, menorrhœa in females, and piles in males; of which Fischer, White Cooper, Haynes Walton, and others, give illustrations. It may occur where there is a tendency to heart-disease, as in a remarkable case recorded by Dr. Gros; or may succeed an attack of rheumatism, as has been recorded by Herveux, Naumann, etc.; or albuminuria (Roche, Coulon, and Lécorché); abscess (Ferrand); ague (Gros); epilepsy (Taylor); typhoid fever (Romberg). One or all of these may precede, or arise as an intercurrent affection, and perhaps play some part in the causation of the disease; yet it must be allowed that these so-called causes very frequently exist without any connexion with this disease. We, therefore, must look for something earlier in the chain of causation, and more definite in its connexion than any of the above. I am of opinion that we must look for this to the nervous system, and especially to the brain; for the disease appears to me to be "hyperneuria", induced by sleeplessness, anxiety, excessive excitability, and irritability, impairing digestion and assimilation;

secondarily interfering with the normal nutrition of the nerve-centres, causing a state of hyperneuriosis with want of power, which induces imperfect secretion by some organ, and, as a necessary consequence of this, if long continued, causes organic changes. And I would here suggest, hypothetically, as a, if not the, remote cause, the excessive formation and abnormal elimination of *cholesterine* or some primary organic compound inducing a specific spanæmic and other changes. Dr. A. Flint, jun. (*American Journal of Medical Science*, Oct. 1862), in studying the physiological relations of *cholesterine*, found there was more *cholesterine* in the blood of the internal jugular vein than in the carotids; *ergo*, *cholesterine* is produced in the brain. He also found, on taking blood from each arm of three hemiplegic persons, that there was more *cholesterine* found in the blood of the healthy than the diseased side; hence he infers that it is produced by nerve-action. He found more *cholesterine* in the blood of the portal vein than in the hepatic; hence he infers that *cholesterine* is eliminated by the liver, but that it is not eliminated unchanged; for neither he nor Marcet was able to find it in the fæces in health. Dr. Flint, however, on treating dried fæces with ether and alcohol, obtained a substance resembling "seroline", to which he has given the name of "stercorine", differing from Marcet's "excretine". He further concludes that "stercorine" results from some change in the "*cholesterine*", which takes place during the process of chylicification; because the amount of stercorine corresponds to the amount of *cholesterine* discharged from the liver. *Cholesterine* is found in the meconium, but stercorine is not; yet, as soon as digestion begins, *cholesterine* disappears, and stercorine is found. In hibernating animals, when they are asleep and not taking food, *cholesterine* is found; but when they are taking food, only stercorine. The fæces of animals fasting contain a small quantity of *cholesterine*.

Now in these cases we have as an early, if not the earliest symptom, evidences of hyperneuria, which would produce *cholesterine* in excess of what is normal; and, secondarily, disturbed digestion, imperfect chylicification, and something wanting in the zoochemical changes of the *cholesterine* into stercorine; for in the fæces of Mrs. H. there was found *cholesterine*, and little or no stercorine. Again, in the first of my cases, there was evidence of excessive formation of *cholesterine*, by the existence of gall-stone at that early age. The constant symptom of alternating diarrhœa and constipation indicates a disturbed biliary secretion. The frequent pathological changes found after death in the liver: the finding of *cholesterine* in the aqueous humour by Naumann; the existence of *cholesterine* in the atheromatous changes that secondarily take place in the arteries,—tend to support this hypothesis; but I am free to confess that these facts are very meagre, and only venture to point to this as a subject for further investigation in this disease.

SYMPTOMATOLOGY. We have first loss of, or disturbed and unrefreshing sleep, from excitement of various kinds; then disturbed digestion, through morbid excitation of the par vagum and sympathetic; impaired chylicification, causing pallor and anæmia; constipation or diarrhœa, through excessive, diminished, or altered bile-discharges, a result of the presence or absence of bile—a thing necessary to the healthy transformation of *cholesterine* into stercorine; then palpitation from altered innervation of the heart; emaciation from imperfect secondary assimilation and blood-elaboration, in which the thyroid body takes a part. The pulsation of the carotids is due to the impulsive character of the *vis a tergo* and disturbed function in the *nervi molles*, lowering the tonicity of the contractile coats of the arteries, which, with a want of specific gravity of the blood, a result of imperfect blood-formation, causes the *bruit*. The *bruit* in the heart arises from altered power of con-

tractility in the muscular fibres of that organ, disturbing the balance between the contracting walls, and resisting fluid; hence it is systolic. The nervation which induces this peculiar action is one of great tension, but small in quantity (if I may be allowed the term). In this way we can explain the absence of the *bruit* as recorded by Datin; also its localisation in the carotids whilst absent in the heart, as in the case of Mrs. H. The rushing and throbbing in the head, particularly during excitement, is due to temporary excessive *vis a tergo*; any injurious consequences to the brain being guarded against by the thyroid body acting as a diverticulum; hence the goitre which is from simple hyperæmia at first, then hypertrophy, increases with excitement, and essentially differs from endemic goitre. The exophthalmic state is a consequence of distension of the intraorbital vessels, pressing the eyeball forwards, as thought by Henoeh, Walton, Siebel, Hirsch, etc.; and it is proved to have this origin by the fact of pressure reducing the exophthalmos, and in fatal cases by the eye receding into the orbit after death (Begbie). It is certainly not due to serous infiltration, as thought by Hamilton, Roche, etc.; nor to excess of intraorbital fat (Middlemore, Desmarres); nor to increase of intraorbital cellular tissue (Basedow, Køben, Heusinger, Naumann); nor to increase of the vitreous humour (Stokes), because the measurements of the globe are not increased; nor to irritation of the sympathetic affecting the orbital muscles (Aran), because the motions are perfect. Vision is rarely impaired, as might be inferred from the ophthalmoscopic examinations of Withusen, Follin, and Argyll Robertson, who found some changes in the choroidal pigment, and increased vascularity.

The coexistence of heart-disease is accidental in the early stage; but, if the disease persist for a long time, we should reasonably expect dilatation of the cavities, without relative hypertrophy of the walls; which has been proved to exist before death by Trousseau, and recorded as a pathological fact by Marsh, Christison, Begbie, etc. The dilatation of the veins is the last expression of the disease; it is not due to the pressure of the goitre, for Begbie found the inferior vena cava dilated; but is no doubt due to static congestion.

**DIAGNOSIS.** The presence of heart-symptoms, emaciation, goitre, and exophthalmos, characterise this disease. From organic disease of the heart it is known by the history, its rapid development and subsidence under treatment; from endemic goitre, by the size of the tumour, by its feel, by the thrill and bruit, and by its subsiding after, and increasing with, excitement.

The **PROGNOSIS** is always favourable, and the more so when the disease has not existed long; the more chronic it is, so much the more likely are we to have secondary organic complications.

The **INDICATIONS OF TREATMENT** are to allay the irritable stomach by the use of ice; to give bland unstimulating nutritious food in small quantities and at short intervals; to produce sound and refreshing sleep by morphia, or any non-stimulating soporific; to administer digitalis to steady the weak heart and control its excitement. Iron is to be given to improve the quality of the blood; and hygienic means must be employed. I do not think local applications of iodine have any good effect upon the goitre. Ice will frequently give relief by diminishing the hyperæmic state.

In considering the disease in its totality, I cannot agree with Begbie, that it is a variety of anæmia, induced by wasting discharges; nor with Bouillaud, that it is a variety of chlorosis; nor with Aran, that it is always associated with heart-disease; nor with Stokes, that it is neurosis of the heart and cervical vessels. I am inclined to think it is hypernæuria of the brain and sympathetic; that this hypernæuria modifies the primary and secondary assimilation; that the latter interferes with the normal elimination of one of the primary animal com-

pounds formed in secretion (cholesterine?), and thus induces spanæmia; that this spanæmic state, acting upon the brain and cardiac nerves, causes the palpitations; and that the other symptoms arise as a consequence of a continuance of this peculiar action of the heart, and of spanæmia, even up to organic changes in the viscera, heart, and vessels.

### CHOREA: RHEUMATISM: PERICARDITIS.

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INSTANCES occasionally occur in which, during the acute symptoms of rheumatism, or shortly afterwards, irregular choreal movements come on. These cases are especially manifested after the heart has been implicated in the rheumatic affection; and the closeness of the sympathy between the heart and the spinal centres has led to the supposition that the fibrous tissues of the cord become affected by rheumatic disease. Of this there is no proof, although it is almost exceptional to find chorea without abnormal sound about the heart, either from pericardial or endocardial disease: still, the connection appears to be one arising from the nervous system, and not from organic change of the spinal membranes or metastasis. Fatal cases of chorea rarely happen, and in such instances either acute pericarditis or valvular mischief, as shewn by fibrous vegetation on the mitral or other parts, are generally detected; but no organic change has been discovered in the spine or its membranes.

It is a matter of doubt whether the energetic treatment, generally adopted in rheumatic carditis, does not favour the irritability of the nervous system, of which chorea is the expression; for patients are rendered anæmic and prostrate by the free use of salines, by calomel and antimony, by depletion and spare diet.

Of the following three cases, the first was one of acute rheumatism with heart affection, in a girl aged 16. Salines were given; and, at the end of the second week, choreal symptoms came on, but quickly subsided under the use of bark and an improved diet. In the second case, a young married lady had acute rheumatism, with slight affection of the heart, four months after the birth of her second child. She was compelled to wean her infant; but, although the rheumatism soon subsided, chorea shortly supervened, and did not completely cease till her strength became established by change of air and sea bathing. The third instance was that of a boy afflicted with chorea. He was relieved by generous diet and by steel medicine, and a systolic bruit became less distinct; but in three months he returned with another attack of chorea, and with pericarditis. The prostration of strength was extreme; still, he rallied, and the chorea ceased; but, after a relapse, the cardiac mischief increased, and fatal syncope ensued. This case was also interesting from the presence of erythema circinatum, an occasional accompaniment of rheumatism. In the first and last of these cases, although pericarditis was well marked, there was an absence of pain in the left side and in the region of the heart; and this will be found to be generally the case in simple pericarditis, that is, where the pleura is not also affected.

**CASE I.** *Rheumatic Fever: Pericarditis: Chorea.* Sarah B., aged 16, was admitted, under my care, into Guy's, October 26th, 1862. She was a servant; and, two days before admission, experienced pain in the ankles, feet, and legs; and when she was brought to the hospital the symptoms of rheumatism were well developed. A purgative of blue pill and compound rhubarb pill was